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SOCIOMETRY

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Sociometry is concerned with the entire range of interests and problems represented by research in social psychology. It is the policy of the editors to seek those manuscripts for publication which represent the significant research interests of investigators who are concerned with giving the field of social psychology theoretical structure and reporting research which is clearly focused, well designed, and competently conducted.

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Communication Structure, Decision Structure and Group Performance [1]

MAUK MULDER, *Netherlands Institute for Preventive Medicine at Leiden and State University at Utrecht*

In the classical Bavelas-Leavitt research on communication structures in task-performing groups it was found that so-called wheel or star groups (cf. fig. 1) worked faster, needed a smaller number of messages and made less errors than circle groups (2, 8). Results were exactly similar in a replication of Leavitt's experiment by us with Dutch subjects (10). In these experiments the task of the group was to identify by means of written communication a symbol, held in common by all group members.

The topological structure determines, according to Leavitt (8), the better performance of the wheel groups. "Centrality," as a measure of "closeness" of an individual position to all other positions in the structure, is also a measure of the "availability of all information," which is necessary for the solving of the group problem. The most central position in the wheel, closest to all other positions, is most likely to get the answer first. This answer-getting potential is very different from the one in the circle, where all members have an equal opportunity to collect all information and to solve the problem.

Quite contrary, however, were experimental results found by Shaw (12, 13). When solving "simple" problems (Leavitt-type) his wheel groups required less time than the circle groups (although the difference failed to reach significance). But his circle groups were faster than the wheel groups for so-called "complex" problems (for an example, see below).

In his theoretical explanation Shaw suggests that the differences found between the structures are due to the "availability of information" (with regard to simple problems) and to the "possibility of contributions" from all members of the group (complex problems).

> "When simple problems are to be solved the availability of information is of primary importance. Thus, the wheel should be faster than the circle because the wheel pattern has the effect of designating which S will perform the function of identifying the common symbol. As the complexity of the problem increases, however, the possibility of contributions from all members of the group becomes much more important. This is true because some S's are more capable than others of solving such problems quickly, and because part

[1] Acknowledgement is due for their participation in this research to Rogier Eikeboom, Hannie Stemerding-Bartens and Ad Stemerding.

solutions can be delegated to various positions, thereby compensating in part for the effects of "saturation." With complex problems, then, the wheel should be slower than the circle because the *central person becomes saturated* (i.e. because the optimal output level is exceeded) and because it sometimes forces the weakest person in the group to function in the leadership role" (13; cf. also 4).

However, the difference between the so-called simple and complex problems is a difference in degree rather than in kind and does not prepare us beforehand for the complete reversal appearing in Shaw's results. Is it then possible to explain the seemingly quite contrary findings of Leavitt and Shaw in one theory, without using the "substantial" concepts of "complexity" and "simplicity" of problems as basic in such a theory?

A characteristic common to the theories of both Leavitt and Shaw seems to be that too much emphasis is laid on the *topological* structure. "Availability of information," "contributions from all members" and "saturation" are *directly* derived from the networks (wheel and circle). However, the topological structure does not determine what really happens, but only what is possible.

Predictions (on "time" and "amount of communication") derived from the topological structure are not validated by the data reported by Leavitt and, for a comparable task, by Heise and Miller (8, 7). Furthermore Guetzkow and Simon, and Flament demonstrated that in different topological structures the developing organization determines the speed of groups when solving Leavitt-type simple problems (5, 6, 3).

This paper attempts to demonstrate that the decision structure, not the topological structure, determines the task performance of a group.

THEORY

Decision Structure

In task-performing groups there is exchange of information items. But besides that, several decisions by individual members have to be made. Among these are the decision to collect all needed information before passing it on; the decision to make a problem solution for one's self, etc. We introduce the construct "decision structure" as referring to: "who makes decisions for whom," and hypothesize that *groups with a more centralized decision structure will be capable of better group performance, because the contributions of the individual group members can be integrated by the person in the central "position" (the leader position).* The theory is restricted to situations in which two or more persons perform a *group task*, as in our experiment in which information, initially divided over all members, must be used to solve the problem.

In contrast to the topological structure, which does not change in time and whose parts are never modified by each other, the decision structure must *develop*. This is only logical, but a very important consequence hereof may be clarified.

A *more centralized structure* is in general characterized by *"vulnerability."* In the case of a centralized interaction structure (referring to "who interacts with whom") a high proportion of the total interaction goes through one of the group members. A disturbance in the functioning of this central position will have a radical effect, because this effect will be spread quickly through the total group and it will be very difficult to send the information flow via other positions.

The manifestation of vulnerability will be a result of the pressure exerted on the central position and its resistance against this pressure.

By *pressure* we mean heavy input and output requirements, such as requests for information or for explanation, by peripheral group members. The capacities, motives and access to resources of the central person determine whether he accepts the "imperatives" in these messages, or opposes them. By *resistance* we mean this relative degree of opposition which may be mobilized versus attempted inductions. An example would be the central person's refusing to send the requested separate information and instead collecting information until he can make the problem solution. Thus would begin the centralization of the decision processes.

It is our opinion that negative effects of vulnerability will become manifest when a centralized interaction structure fails to sufficiently develop toward a strongly centralized *decision structure*. In experiments such as Leavitt's and Shaw's, newly formed groups start new tasks. If they fail to develop centralized decision structures we expect that, in the beginning of the "work phase," groups with a more centralized interaction structure (wheel groups) will perform no more effectively and eventually may perform less well than do less centralized (circle) groups. Now Shaw's experimental group tasks differ in an essential way from those of Leavitt and Guetzkow. While the latter groups solved fifteen problems, the former performed only three or four tasks.[2] The opportunity for the centralized decision structure to develop itself is considerably smaller in Shaw's experiments because of the smaller number of problems (which also leads to a shorter work period).

There is support for this theory in reported data. In Shaw's experiments half,

[2] Another crucial difference concerns the size of the groups (number of positions): Shaw's groups are smaller. This variable has been studied by the present writer in an experiment, reported in 11. In this publication it is also explained why the three-position circle and other totally interconnected structures are inadequate for testing Shaw's participation-theory.

or less than half, of the wheel groups develop into strongly centralized decision structures in which a central person makes the solution and sends it out, while in the experiments by Leavitt, Guetzkow and the present writer all wheel groups develop into such "central" groups. In the temporal analyses of these latter investigators and others, the weak start of wheel groups is apparent (8, 5, 9, 10).

With regard to the seemingly controversial results for "simple" and "complex" problems, it does *not* seem correct to state that "the wheel allows for better performance with simple problems, the circle with complex ones," but that the more centralized decision structures, which developed in Leavitt's groups solving 15 problems, enabled a better performance. Furthermore, the *gradual* difference between simple and complex problems has the effect, simply, that the development of the more centralized decision structure takes more time (i.e., problems) with the complex problems than with the simple ones.

An operational definition of the decision structure is as follows.

In the experimental groups a person (e.g. the central person in the wheel) may function as a mere "relayer" or as an "integrator." In the latter case he may make the decision not to pass the messages he receives, but to withhold them till he himself can make the problem solution and then he may (a) send the solution to other group members or (b) send the solution plus all necessary information in one message to other group members or (c) send all necessary information in one message to other group-members.

The "centrality index," which measures the degree of centralization of the decision structure, is based on communication acts of these three "types," all of them referring to decisions which have consequences for other group members.

The "decision centrality index" (D.C.I.) is computed in this way: As a first step, for each person in the group, it is necessary to compute how many persons are supplied by this person with messages of type (a), (b) or (c). This is done by a precise analysis of the communication-content.[3] Second, the scores of all "positions" in the group are summed up. Third, the *proportion* of every "position" is calculated by dividing his individual score by the total score. The last step is to calculate the *difference* between the "position" with the highest proportion and the "position" with the next highest. Thus the "decision centrality index" (D.C.I.) gives a measure of the centralization of the decision structure on *one* "position" (the "leader"). It may vary from 0 to 1.00.

[3] In this operation type (b)- and (c)-content, although *in principle different*, are given the same weight (=1), because when all information is put together on one sheet, the solution of *this experimental task* can be read off easily. Type (a)-content is weighted double (=2) because here the person who sends out the solution does not allow for *any* participation in the solution by the "receiver."

Hypotheses

The theory is laid down in the following hypotheses.

1. To the extent that the decision structure of groups is centralized, the groups will give a better performance in their group tasks.[4]

The specific hypotheses to test in the present experiment are:

1a. To the extent that the decision structure of groups is more centralized, the group task will be performed faster.

1b. To the extent that the decision structure of groups is more centralized, the quality of the task performance will be better.

1c. To the extent that the decision structure of groups is more centralized, the group task will be performed more efficiently.

Performance per time-unit is measured by the time the group needs to solve its problem. The quality of performance is defined here by the number of errors made by the group during the task accomplishment. Efficiency is defined by the number of messages the group needs to solve the problem.

2. To the extent that a structure is more centralized, it is characterized by a greater "vulnerability." The vulnerability will manifest itself when the pressure exerted on the central position of the structure is greater than its resistance.

In our experimental design, the wheel groups start with a centralized *interaction* structure, but they do not immediately develop a centralized decision structure. We expect then that, during the beginning of the work period, the resistance of the center will be smaller than the pressure on it. Specific hypotheses:

2a. To the extent that the interaction structure in groups is more centralized, the group task will be performed relatively more slowly during the beginning period of the work.

2b. To the extent that the interaction structure in groups is more centralized, the quality of the group task will be relatively poorer during the beginning period of the work.

2c. To the extent that the interaction structure in groups is more centralized, the group task will be performed relatively less efficiently during the beginning period of the work.

These hypotheses can be tested in the experiment, by comparing the performance of more centralized (wheel) groups and less centralized (circle) groups, during the first part of the work-period (for instance, in the first two problems) and in the last period of the work (last two problems).

Shaw has found that the "corrective power" (determined by comparing the number of corrected errors with the total number of errors) is smaller in wheel than in circle groups. This is in agreement with the vulnerability hypothesis, so the specified hypothesis can be formulated:

2d. To the extent that the interaction structure is more centralized, the "corrective power" of the group will be smaller.

---

[4] It is understood that the groups accept as their task to work as fast as possible. Should the group goal be: "to work slowly and badly," more centralized groups should perform this task "better."

PROCEDURE

The Experimental Groups

In the present experiment two topological structures of four positions are investigated: wheel and circle. (cf. fig. 1.)

Twenty-six groups were run, 13 for each "structure." The subjects were students of Leiden University in their first year. They were naive in this type of experiment and were instructed to work as a group as fast as possible. Subjects of a given group were not acquainted with each other prior to the experiment; instructions for the experiment were given them after they were seated together. They were told who could communicate with whom, but the structure was not made explicit.

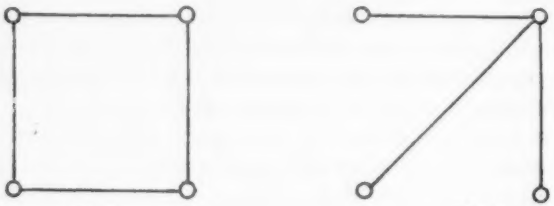

FIGURE 1

The Experimental Situation

The subjects were told that we wanted to investigate how fast groups can solve certain abstract problems. Five problems had to be solved; the writer would have preferred more problems, to allow for the complete development of the decision structure, but this was the maximum possible in the time the subjects had available. The problems were the "complex" ones Shaw had used. The following is an example:

A small company is moving from one office-building to another. It must move four kinds of equipment: (a) chairs, (b) desks, (c) filing-cabinets and (d) typewriters. How many trucks are needed to make the move in one trip?

The eight items of information needed to solve the problem are that the company owns a total of 12 desks, 48 chairs, 12 typewriters, 15 filing-cabinets, and that one truckload can take 12 typewriters, or 3 desks, or 5 filing-cabinets, or 24 chairs.

The statement of the problem was typed completely on each of four separate cards and each of the eight items of information was typed on a separate card. Each subject was given one of the problem cards; the information was equally divided over the group members. For completion of the group task each subject has to know the problem solution.

The subjects were seated around a circular table, so that each was separated from the next by a vertical partition from the center to the table's edge. The partitions had slots permitting subjects to push written message cards to the persons on either side of them.

To allow for communication to the other members of the group, a four-layered quadrilateral box was placed at the center of the table. The box was placed so that the partitions just touched each of the four points of the quadrangle. Each of the four resulting work spaces was painted a different color. The subjects were supplied with blank message cards whose colors matched those of their work spaces. Any message sent from a booth had to be on a card of the booth's color.

Measurement

When the group had solved the problems, each subject was asked to fill out a questionnaire, in which mainly measurements of satisfaction and leadership were made. The most important data in this experiment, however, were time scores, communication units and errors. These could be directly observed during the session or analyzed from the material afterwards.

RESULTS

First we will report results of analyses of circle versus wheel data, bearing especially on the "development hypotheses" (2a., 2b., 2c.) but also on 1a., 1b. and 1c.

Then we will report results of analyses based on the degree of centralization of the decision structure during the last phase of the work. Only hypotheses 1a., 1b., and 1c. will be tested in these analyses.

With regard to the development of the group structure, the decision centrality index of the wheel groups during the last two problems is .51; that of the circle groups is .24. This difference is significant (Mann Whitney U Test: $p < .01$ one-tailed test).[5] For the *first* phase of the work period, no such difference occurs. Each position's proportion of the total *interaction* remains the same during the work period, both in the wheel groups and in the

[5] Since the data satisfied few of the assumptions of normal-distribution methods, only "distribution-free" methods have been used. Results will be stated for a one-tail test, since they test directional predictions. For more details on this study cf. 11.

TABLE 1 *

Mean Time per Problem (for Total Group) in Minutes

	First Problem	Second Problem	Third Problem	Fourth Problem	Fifth Problem	All Problems
Circle	13.95	8.70	6.60	6.55	7.25	8.61
Wheel	16.27	9.92	6.13	5.85	5.88	8.81
Circle minus Wheel	−2.32	−1.22	+0.47	+0.70	+1.37	

* Note: 13 circle groups are compared with 13 wheel groups. The interaction between structure and problem sequence is significant (Kendell's Tau = 1.0, p = .01).

circle groups. Thus the interaction structure does not appear to develop in wheel or circle groups.

Wheel versus Circle

In Table 1, data on the speed of the work performance are reported.

The increase in "superiority" of the wheel appears clearly from the data in the last row. In the beginning of the work period, the circle groups are faster than the wheel groups, but the difference decreases. In a later phase the relation is reversed, and then the difference increases. Thus hypothesis 2a is strongly supported.

Hypothesis 1a is not confirmed. Although the wheel groups are faster in the fourth and fifth problems, the difference fails to reach significance.

In Table 2, data on the quality of the performance are reported.

It appears that 60 per cent of all wheel errors are made in the first two problems, 19 per cent in the last two. For the circle these figures are, respec-

TABLE 2 *

Errors per Problem

	First Problem	Second Problem	Third Problem	Fourth Problem	Fifth Problem	All Problems
Circle	9	15	8	7	18	(57)
Wheel	20	12	11	4	6	(53)

* Note: The difference between wheel and circle in the 2 x 5 table is significant at the .05 level (likelihood ratio test of the independence hypothesis).

The differences between wheel and circle in the fifth problem and in the fourth and fifth problems together are significant at the .05 level (Chi square, with correction for continuity).

TABLE 3 *

Mean Number of Messages, per Problem, per Position

	First Problem	Second Problem	Third Problem	Fourth Problem	Fifth Problem	All Problems
Circle	8.20	7.08	5.88	5.75	6.28	(6.64)
Wheel	7.15	5.68	3.63	3.43	3.38	(4.65)
Circle minus Wheel	+1.05	+1.40	+2.25	+2.32	+2.90	

* Note: The interaction between structure and problem sequence is significant (Tau = 1.0, p = .01).

The difference between wheel and circle is not significant in the first problem; it is significant at the .01 level in the last problem (Mann Whitney U test).

tively, 40 per cent and 44 per cent. This difference between wheel and circle groups is large and significant. Hypothesis 2b is thus strongly supported by these findings.

The same holds for hypothesis 1b. In the last phase of the work period, the wheel groups make fewer errors than the circle groups.

With regard to errors, hypothesis 2d is also strongly supported by the data. In the circle groups, 29 errors are corrected from a total of 57 errors; in the wheel, only 13 are corrected from a total of 53. The difference is significant (Chi-square: $p<.01$).

In Table 3, data on the efficiency of the task performance are reported.

Again the superiority of the wheel increases steadily from first to fifth problem. Hypothesis 2c has found strong support.

While the difference is not statistically significant in the first phase of the work period, it increases to such an extent that, in the later phases, it is large and significant. Thus hypothesis 1c also is strongly supported.

D.C.I. in Last Phase

We now turn to the second set of analyses, based on the degree of centralization of the decision structure achieved by the groups in the last problem. For every group, the decision centrality index during the last problem was calculated; then the wheel groups were divided in two classes, containing the six more-centralized and the six less-centralized wheel groups; the same was done with the circle groups.

Results of these analyses are reported in Table 4.

It will be noted in Table 4 that the sub-classes of wheel and circle groups varied substantially in degree of centralization of decisions. The less centralized six among both wheel and circle groups achieved only a low level of centralization, while the more centralized six achieved a substantial level, even among

TABLE 4*

Decision Centrality Index, Speed, Quality, and Efficiency, on Last (Fifth) Problem

	n (1)	D.C.I. (2)	Time to Solve (3)	Errors (4)	Messages per Position (5)
More-centralized wheel groups (W_1)	6	.85	4.01	0	2.46
Less-centralized wheel groups (W_2)	6	.17	7.88	5	4.21
More-centralized circle groups (C_1)	6	.54	5.79	4	4.88
Less-centralized circle groups (C_2)	6	.07	8.84	12	7.46

* Note: Within the table, differences in D.C.I., time and messages are tested with the Mann Whitney U test. The difference in errors is tested with Fisher's exact test.

Results are for one-tail test, except the D.C.I.-comparison of W_2 versus C_1.

Significance of differences:	$P < .01$	$P < .05$
W_1–W_2,	Col. 2, 3, 5	——
W_2–C_1,	2	Col. 3
C_1–C_2,	2, 5	3
W_1–C_2	3, 4, 5	——

circle groups. Indeed, the C_1 groups show a significantly higher level than the W_2 groups.

The time data are according to prediction on the basis of the decision centrality index: groups with a more centralized decision structure are faster, as is apparent from the large and significant differences between W_1 groups and W_2 groups, C_1 and C_2 and W_1 and C_2. The most important datum, however, is that the circle groups with a more centralized decision structure (C_1) needed considerably less time than the less centralized wheel groups (W_2). From these findings it may be concluded that the decision structure is the primary determinant of the speed of performance. The more centralized the decision structure, the faster is the group's performance. Hypothesis 1a is thus strongly supported by these experimental results.

The number of errors decreased with increasing decision centrality index (Tau: $p<.05$) but some differences are extremely small. Only the difference between the most centralized groups (W_1) and the least centralized ones (C_2) was significant. These results give support to hypothesis 1b.

With regard to number of messages, a large difference exists between W_1 and C_2. Also, within the topological structure, an increasing decision centrality index leads to a decreasing amount of communication. But C_1 groups did not need fewer messages than W_2 groups. Hypothesis 1c is supported, but the degree of centralization of the interaction structure also exerts some influence on the *amount* of communication.

Some of our data on the distribution of communication over the different "positions" within the group are very relevant in connection with Shaw's con-

TABLE 5 *

Mean Number of Sent Messages, per Position, in Last Problem

Central position $W_1 = 4.67$	Peripheral positions $W_1 = 1.72$
Central position $W_2 = 7.17$	Peripheral positions $W_2 = 3.22$
Circle position $= 6.17$	

* Note: Differences are tested with Mann Whitney U Test (one-tail-test).
The difference between central positions in W_1 and central positions in W_2 is significant at the .05 level. The difference between peripheral positions in W_1 and peripheral positions in W_2 is significant at the .01 level.

cept of "saturation." In the wheel groups, the central person sends out a mean of 8.7 messages per problem, the "peripherals" 3.3. One may question whether the central person does not exceed the optimal output level. He may do so in the beginning (mean number of messages = 13.6) but definitely does not at the end (mean = 6.2). Here his communication activity is not different from that of circle members (cf. Table 3). Table 5 presents a further crucial data bearing on this problem.

Persons in the center position of the decision structure in W_1 *send out* fewer messages than central persons in W_2 (and less than circle members, although this difference is not significant). The number of messages they receive is made up of the number the peripherals send. Thus it appears from the table that the central persons in W_1 also *receive* fewer messages than central persons in W_2. These relations do not change when a correction is made for time differences. Thus the communication activity (input and output) of the central position even decreases when centralized decision structures develop, and the saturation hypothesis must be rejected.

DISCUSSION

In early studies in this field, stress was laid on the topological structure as a determinant of group performance. Guetzkow and Simon, and Flament, however, already demonstrated that, when *simple* problems are solved, the *speed* of the group's performance is determined by the organization which the group develops.[6]

A theory by Shaw states that "availability of information" determines the performance of groups when simple problems are solved, but that for more complex problems the possibility of contributions from all members becomes

[6] Simon and Guetzkow refer to "optimal organizations." In their *conclusions* they do not distinguish the decision structure from the interaction structure (cf. 6 and also for more elaboration on this point 11).

much more important. Groups which allow for participation of all group members should perform complex tasks faster than groups where this is not the case. Shaw tested this theory by a comparison between groups with a topological circle structure and groups with a wheel (star) structure. The latter structure may be called a centralized interaction structure, since all interaction is "to" or "from" a central position. The former structure should permit more participation of all members.

The present theory is quite the reverse. It states that a high degree of centralization of the decision processes leads to better group performance.

Shaw assumes a sharp, "substantial" difference between simple and complex problems. This difference, however, is one of gradation. In our opinion the essential point is that, irrespective of the complexity of the problem, *integration* of the group process is necessary. When two or more persons work on the same task, so that the work of each of them is only a part of the "total," the integration of their contributions is a basic condition for a good end performance. When decision structure refers to "who makes decisions for whom," integration is secured to an optimal degree by a strongly centralized decision structure. The central person can then integrate the contributions of all individual members.

The theory is confirmed by the experimental results. In a number of our groups, a centralized decision structure develops during the work period, even though it was relatively short. These groups performed their tasks with more speed, fewer errors and more efficiency than groups where centralization of the decision processes did not develop to such an extent.

In Shaw's participation theory it is hypothesized that, as a consequence of centralization processes, the central person would become "saturated" because the optimal output level would be exceeded. Our data, however, demonstrate that, in groups where a more centralized decision structure develops, the central position is not characterized by a greater communication input or output, but rather by a smaller one. Thus the saturation hypothesis proves to be incorrect.

The data also demonstrate that the development of a centralized decision structure (and, consequently, a better group performance) is to a very considerable degree independent of the topological structure or the interaction structure. But *if* the centralized decision structure develops on the basis of a centralized interaction structure, this leads to some special consequences. More centralized structures are in general characterized by a greater "vulnerability." By this is meant that a disturbance in the functioning of the central position will quickly disturb the functioning of the total group. Now we hypothesized that in groups with a centralized interaction structure (as the wheel groups in the experiment) such disturbances in the functioning of the central positions should occur *in the beginning* of the experimental sessions. Then the input

and output requirements of the central position would be such that he could not meet them. This would lead to negative results for the group's performance.

This hypothesis, which may explain some of Shaw's results, is also confirmed by our results. The more centralized interaction structures demonstrate a greater vulnerability at the beginning of the work, which leads to negative performance results. The development of centralized decision structures appears to cancel these initial negative effects radically.

SUMMARY

This paper reported a laboratory investigation testing two hypotheses about group structure and group performance. The first hypothesis was that the more centralized the decision structure of groups, the better will be the group's performance in regard to speed, quality and efficiency. The second hypothesis stated that more centralized structures are generally characterized by "vulnerability," which leads to negative performance results as long as centralized *decision* structures have not developed. These hypotheses were confirmed by the results of an experiment in which groups of four persons solved so-called complex problems.

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REFERENCES

1. Bavelas, A., "A Mathematical Model for Group-Structures," *Applied Anthropology*, 1948, 7, 16–30.
2. Bavelas, A., "Communication Patterns in Task-Oriented Groups," in D. Cartwright and A. Zander (Eds.), *Group Dynamics*, New York: Row-Peterson, 1953, 493–506.
3. Flament, C., "Changements de Rôles et Adaptation à la Tâche dans les Groupes de Travail Utilisant Divers Réseaux de Communication," *L'Année Psychologique*, 1956, 2, 411–431.
4. Gilchrist, J. C.., M. E. Shaw, and L. C. Walker, "Some Effects of Unequal Distribution of Information in a Wheel-Group Structure," *Journal of Abnormal and Social Psychology*, 1954, 49, 554–556.
5. Guetzkow, H., "Organizational Development and Restrictions in Communications," Dittoed paper, Carnegie Institute of Technology, 1951 (108 pp.).
6. Guetzkow, H., and H. A. Simon, "The Impact of Certain Communication Nets Upon Organization and Performance in Task-Oriented Groups," *Managememnt Science*, 1955, 1, 233–250.
7. Heise, G. A., and G. A. Miller, "Problem Solving by Small Groups Using Various Communication Nets," *Journal of Abnormal and Social Psychology*, 1951, 46, 327–335.

8. Leavitt, H. J., "Some Effects of Certain Communication Patterns on Group Performance," *Journal of Abnormal and Social Psychology*, 1951, 46, 38–50.
9. Luce, R. D., J. Macy, L. S. Christie, and D. H. Hay, "Information Flow in Task Oriented Groups," Technical Report No. 264, 1953, Research Laboratory of Electronics, Massachusetts Institute of Technology.
10. Mulder, M., "Groepsstructuur en Gedrag," *Nederlands Tijdschrift voor de Psychologie*, 1956, 11, 85–133.
11. Mulder, M., "Group-Structure and Group-Performance," *Acta Psychologica*, 1959, 15.
12. Shaw, M. E., "Some Effects of Unequal Distribution of Information Upon Group Performance in Various Communication Nets," *Journal of Abnormal and Social Psychology*, 1954, 49, 547–553.
13. Shaw, M. E., "Some Effects of Problem Complexity Upon Problem Solution Efficiency in Different Communication Nets," *Journal of Experimental Psychology*, 1954, 48, 211–217.

Parental Coerciveness, Child Autonomy, and Child's Role at School [1]

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The present study is part of a larger research project dealing with the effects of the child's experiences in the home on his role at school. The independent variables dealt with here will be parental coerciveness and child autonomy, as perceived by the child. By parental coerciveness, we mean the extent to which the parents punish the child, physically or by deprivation. By child autonomy, we mean the extent to which the child is free to act without immediate adult supervision.

The theory is essentially that boys who perceive their parents as being highly coercive and also report themselves as having high autonomy will be successfully assertive in the school situation.

It is postulated that perceived parental coerciveness arouses hostility in the child. Also, because it often seems to the child to be arbitrary and to disregard his needs and interests, and because it heightens the power discrepancy between parent and child, the perception that parents are coercive should evoke in the child needs for self-assertion and for status as an important person.

The role of autonomy in the present theory is that it provides the conditions for the child's learning skills which have relevance for peer group leadership, and for developing self-confidence in independent action—characteristics which should help the child satisfy the needs induced by parental coerciveness. Furthermore, experiencing autonomy may function to soften the hostility that coerciveness engenders, just as coerciveness may function to restrict somewhat the impulsivity that autonomy alone might produce.

In sum, parental coerciveness is seen as a motivating force and child autonomy as a facilitating agent. This view led to the expectation that children whose parents are perceived as both coercive and autonomy-granting will be *successfully* assertive in the three major areas in school—academic performance, social influence, and friendship. It was expected that in each area they would assert themselves more, and would do so more successfully. The specific

[1] This study was reported at a meeting of the American Psychological Association, 1958. It is part of a research project financed by the National Institute of Mental Health and the Foundations Fund for Research in Psychiatry.

predictions were that boys who report high parental coerciveness and high autonomy will:

1. show higher academic performance [2]
2. make more personal influence attempts on peers
3. use more directiveness in their influence attempts
4. achieve greater success in personal influence on peers
5. engage in more group-oriented leadership
6. show more active friendliness toward peers
7. be better liked by peers.

METHOD

Subjects in the study included 211 third through sixth grade boys in three elementary schools in Detroit. To minimize extraneous variables, the sample included only children from white, non-immigrant, intact families. Although the total group represented a socio-economic cross section, excluding only families at the extreme ends of the continuum, each school was relatively homogeneous with respect to social class.

Data on the independent variables, parental coerciveness and child autonomy, were obtained from children's questionnaire responses. One questionnaire required the child to indicate the person or persons who from his own experience fitted each of a series of behaviors, such as "punishes" and "threatens," and also to indicate the person who fitted best in each case. Weighted responses to "punishes," "threatens," and "hits" were combined into an overall parental coerciveness score, and the top quartile, those indicating the strongest association between these behaviors and their parents, were taken as the *high coerciveness* group.

The measure of autonomy was based on the child's responses to the following questions:

1. How often do you go some place in a bus or street car without a grownup going along with you?
2. How often do you make plans to go to the movies with someone before you ask your parents?
3. How often do you buy something all by yourself without having to ask your parents about it first?
4. How often do you ask your parents if you can go out after supper on school nights?

The child checked one of the following responses: *quite often, sometimes,* and *hardly ever.* For the fourth question, an additional alternative was included: *never have to ask.* In computing autonomy scores, *quite often, sometimes,* and *hardly ever,* when given in response to the first three questions, were assigned

[2] For academic performance, there is only a measure of success. No measure of amount of assertive behavior in this area was available.

scores of two, one, and zero points, respectively. For the fourth question, *never have to ask* was scored two points, and any other answer, zero. The top quartile constituted the *high autonomy* group.[3]

Fourteen boys obtained top quartile scores on both variables and were used as the *high coerciveness-high autonomy* group.

The dependent variables were measured mainly by teacher ratings, although one variable, how much the subjects were liked, was measured by classroom sociometrics. Each teacher rated the children in her class on a six-point scale and was instructed to place a certain number of subjects at each point, so that each classroom distribution of scores conformed more or less to a normal curve. The sociometric ratings consisted of rankings of each child on a four-point scale by all the boys and girls in the classroom. These ratings were similarly standardized for each classroom.[4]

Hypotheses were tested first by comparing the mean scores obtained on each of the dependent variables by the *high coerciveness-high autonomy* group with the mean scores obtained by all other subjects. Then, to show that it is the two independent variables acting in combination which produce the predicted effect, rather than either variable alone, the *high coerciveness-high autonomy* group was compared with (a) the group high only on coerciveness, and (b) the group high only on autonomy. If the hypotheses are correct, the *high coerciveness-high autonomy* group should in all comparisons obtain higher mean scores on each of the seven dependent variables. T-tests for significance of differences between means were made.[5]

RESULTS

The results are summarized in Table 1. When the *high coerciveness-high autonomy* group was compared to the remainder of the sample, all differences were in the predicted direction—significantly so for the following variables: academic performance, use of directiveness, success of influence, group leadership, and active friendliness. Differences in the number of personal influence attempts and in sociometric liking by peers were significant at between the .05 and .10 level.

[3] Because autonomy was related to grade in school, scores were standardized by taking the top quartile for each grade.

[4] Coerciveness and autonomy are negatively related to socio-economic status. As a result, the high coerciveness-high autonomy boys have more fathers in blue collar occupations than the remaining group of boys (71 per cent as compared to 58 per cent). However, socio-economic status was roughly controlled since the child peer-behavior measures were standardized within classrooms which were relatively homogeneous with respect to this variable.

[5] Because autonomy and coerciveness did not yield proportionate cell frequencies, it was decided not to do an analysis of variance. Furthermore, the statistical method actually employed seemed most appropriate for the particular theory here under investigation.

TABLE 1

Perceived Coerciveness—Autonomy Patterns and the Child's Role at School

Variable	High Coerciveness High Autonomy (N = 14) Mean	SD	Remainder of Sample[a] (N = 197) Mean	SD	High Coerciveness Only[a] (N = 49) Mean	SD	High Autonomy Only[a] (N = 42) Mean	SD
Academic performance	3.79	1.25	2.98*	1.39	3.12*	1.20	2.71*	1.24
Personal influence attempts	4.15	1.34	3.51†	1.42	3.49†	1.50	3.81	1.49
Use of directiveness	4.64	1.08	3.58*	1.43	3.78*	1.52	3.86*	1.42
Success of influence	4.07	1.33	3.25*	1.38	3.31*	1.31	3.29*	1.42
Group leadership	3.86	1.29	3.07*	1.33	3.23*	1.24	2.79*	1.41
Active friendliness	4.00	.95	3.31*	1.40	3.43†	1.44	3.34†	1.43
Liking by peers (sociometric)	3.64	1.69	2.93†	1.96	3.06	1.93	2.86†	1.91

[a] Excludes high coerciveness-high autonomy.

† Difference between means significant at the .10 level (one-tailed test).

* Difference between means significant at the .05 level (one-tailed test).

When the *high coerciveness-high autonomy* group was compared to the group high only on coerciveness, and to the group high only on autonomy, positive results were also obtained.

The results clearly support the hypotheses and indicate that it is high coerciveness and high autonomy *acting in combination* that produce the predicted effects.

INTERVENING PROCESSES

In addition to testing the major predictions derived from the theory, it was also possible to test the assumptions about the processes intervening between the independent and dependent variables. According to the theory, perceived parental coerciveness engenders hostility and needs for self-assertion, while autonomy fosters the development of skills and self-confidence. To test these assumptions, subjects reporting high parental coerciveness (top quartile) were compared to all other subjects with respect to hostility and needs for self-assertion; and subjects high on autonomy (top quartile) were compared to all others with respect to skills and self-confidence.

Measures of hostility and needs for self-assertion were obtained from children's questionnaire responses in which the child was asked to indicate whether he experienced certain emotional states *very often, pretty often, not very often,* or *hardly ever.* The child was asked each item twice, once with respect to the home situation and once with respect to the school situation. A conscious hostility scale was composed of four pairs of items:

—feel like getting even with somebody because they made me mad.
—feel mad at the other kids when things go wrong.
—feel angry because a grownup doesn't let me do something I want to.
—feel mad because I'm forced to do something I don't want to.

It was found as expected that boys who report high parental coerciveness acknowledge significantly more feelings of hostility than do other boys (Table 2).

TABLE 2

Coerciveness and the Child's Hostility and Self-Assertion Needs

	High Coerciveness (N = 63)	Remainder of Sample (N = 148)
High hostility	52%	39%*
High self-assertion	57%	43%*

* Difference between proportions significant at the .05 level (one-tailed test).

TABLE 3

Autonomy and the Child's Physical Coordination, Self-Confidence, and Self-Potency

	High Autonomy (N = 56)	Remainder of Sample (N = 155)
High physical coordination	61%	50%†
High self-confidence	73%	58%*
High self-potency	71%	58%*

† Difference between proportions significant at the .10 level (one-tailed test).
* Difference between proportions significant at the .05 level (one-tailed test).

One of the items in the same questionnaire asked the child how often he felt "like trying hard to do better than someone else." Responses to this item for the home situation and the school situation were used as the measure of needs for self-assertion. Boys reporting high parental coerciveness were significantly more likely to report this feeling than were other boys (Table 2). Thus, both assumptions about coerciveness were borne out by the data.

For a measure of skill which was relatively free of motivational factors, teacher ratings of the child's physical coordination were used. It was found, as expected, that the *high autonomy* boys had higher physical coordination, although the finding fell just short of significance (Table 3).

As a measure of self-confidence, subjects' judgments about their own manual skills, sports ability, physical attractiveness, and strength were combined into an overall measure. The *high autonomy* group showed significantly more self-confidence (Table 3). Furthermore, as a complementary measure that might be called *self-potency*, we used subjects' responses to a question which asked whether they felt they could "change themselves" if they wanted to. *High autonomy* boys were significantly more likely to report that they felt they could "change themselves" (Table 3). Thus, the assumptions about the role of autonomy in the theory were also borne out by the data.

CONCLUSIONS

It is tentatively concluded from this study that (a) boys who report high parental coerciveness will have needs for hostility outlets and self-assertion, (b) autonomy facilitates the effective expression of these needs in the peer group, and (c) that, probably due to the combination of these two effects, boys reporting high parental coerciveness and child autonomy are successfully assertive in school.

Some limitations of the present study which suggest fruitful areas for further research should be pointed out. First, the independent variables are children's perceptions. It would be interesting to see what the relationship is

between these perceptions and the objective situation, and to compare how each of these relates to the dependent variables. Second, the theory concerns boys. It seems likely that assertiveness in girls is less valued by others, so that, even if parental coercion and autonomy produce the same behavioral response pattern in girls as in boys, the reactions of other children to this pattern would be quite different. It is also possible that girls respond more to the *emotional rejection* that coercion may imply than to the *clash of wills*, and further that autonomy among girls may lead to the development of entirely different kinds of skills.

A third point of interest is that the present study has taken as its dependent variable a specific pattern of behavior and not social or psychological adjustment *per se*. This is important in considering the relation of this study to previous research and in trying to ascertain practical implications. For example, previous investigators have suggested a relationship between parental coerciveness and authoritarianism (1, 2, 3). This is not *inconsistent* with the present findings, but if it is true that the *high coerciveness-high autonomy* group are also characterized by authoritarianism, then the present investigation suggests that this group includes authoritarian *leaders* rather than authoritarian *followers*. Furthermore, school performance at the elementary school level is somewhat tied to conformity to authority, and it may be that the superior performance of the *high coerciveness-high autonomy* group will not be maintained in high school and college where original thinking becomes more important.

SUMMARY

Parental coerciveness toward boys was hypothesized as arousing hostility and needs for self-assertion; and autonomy, as softening this hostility and contributing to the development of social skills and self-confidence. Thus, autonomy was seen as facilitating the effective expression in the peer group of needs engendered by coerciveness. The sample consisted of 217 elementary school boys. Data collection procedures included interviews, classrooom sociometrics, and teacher ratings. To test the hypotheses, the boys in the upper quartile on both coerciveness and autonomy were compared with the remainder of the sample, and with those who were high on only one of these variables. The overall pattern of the findings supported the hypotheses.

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REFERENCES

1. Frenkel-Brunswik, Else, "A Study of Prejudice in Children," *Human Relations*, 1948, 1, 295–306.
2. Harris, D. B., H. G. Gough, and W. E. Martin, "Children's Ethnic Attitudes: 2. Relationship to Parental Beliefs," *Child Development*, 1950, 21, 169–182.
3. Lyle, W. H., and E. E. Levitt, "Punitiveness, Authoritarianism, and Parental Discipline of Grade School Children," *Journal of Abnormal and Social Psychology*, 1955, 51, 42–46.

Disengagement—A Tentative Theory of Aging [1]

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We have no social-psychological theories of aging—which is surprising when we consider the number of our theories of development and maturation. It is true that Plato (1) discussed the advantages and disadvantages of the aged state, but he offers no theory of the process which leads from the "tyranny" of youth to the "freedom" of age. Riesman (2) talks about aging, but he is really elaborating a typology of personality—he tells us that people with inner resources use them in old age—but this does not guide us as to the nature of the change from middle to old age. Erikson (3) gives us a comprehensive picture of continuing development from childhood to maturity, but here he stops, leaving the mature person on a developmental plateau. However, his model of development can profitably be extended into old age.

There does, however, seem to be an implied theory of the aging process which underlies many empirical studies. We receive the impression that society withdraws from the older person, leaving him stranded. Many problem-oriented studies are based on the assumption that this tendency can be prevented by various programs for the aged designed to restore a measure of supportive social structure to the individual. We will offer an explicit alternative to the implied theory, namely that the individual cooperates in a process of disengagement which takes place between himself and society.

In contrast to the paucity of theories, there is a growing body of research into the social-psychological characteristics of older populations (4). However, there is very little evidence that chronological age is a powerful variable. We do not know, in other words, whether the characteristics of these older groups distinguish them from younger ones. For example, when we read that a certain percentage of a group of old people feel lonely or isolated, we do not know whether or not this distinguishes them from a younger population. We do know that, *within* an older population, age itself seems to make very little difference. In short, although we have the intuitive feeling that age *should*

[1] This paper reports research findings from The Kansas City Study of Adult Life, a project of the Committee on Human Development of the University of Chicago. The research is financed by the National Institute of Mental Health and the Principal Investigator is Dr. William E. Henry. The senior author was project director at the time of the study here reported; she has since joined the staff of the Department of Mental Hygiene, New York State.

make a difference, we know very little about what change age alone makes in such matters as patterns of interaction, attitudes, beliefs, and general orientation to life. It is to this question that our research has been in part directed.

THE STUDY

This paper reports the formulation and testing of three hypotheses about the social-psychological changes inherent in the aging process. These three hypotheses will be concerned with our central idea that the "freedom" of old age results from a decreasing amount and variety of interaction. They will also be concerned with the process involved in this change of interaction pattern and attempt to show that it is preceded by a changed perception of the self. Finally we will test the hypothesis that there is a change in the quality of interactions in which older people engage.

The results reported here are based on a study of 211 persons, drawn partly from a longitudinal study of a panel of healthy adults between the ages of 50 and 70, and partly from a special study of a group of ambulatory old people between the ages of 70 and 90. The panel approximates a stratified random sample of the healthy adults of the Kansas City Metropolitan Area, but we do not know the relationship of the older group to their universe. Comparing the two groups, there is no difference in the distribution by sex, religion, or ethnic origin, but the working class is more heavily represented in the older group than in the panel. The data presented here are selected from three successive interviews separated by about six months from one another.

FIRST FORMULATION

Defining a process of change is helped by first defining the difference between the baseline and the end point. Therefore, on the basis of general knowledge, inquiry, personal experiences, anecdotes, the experience of our own interviewers, literary portrayals, and a small number of formal interviews with very old people, we set forth what appeared to be the salient qualities of the style of interaction of healthy old people, qualities which distinguish them from the middle-aged. They were eccentricities of both manner and response, including very little anticipation of criticism or contradiction, and a certain carefree self-centeredness. For example, when we asked our interviewers to distinguish between the oldest and youngest of their respondents, they said they found the very old to be much less concerned about approval in the interview situation, much more spontaneous in expressing their own idiosyncratic opinions. Secondly, when we asked our friends and colleagues to describe healthy old people, the word carefree occurred quite frequently, although the informant was almost always talking about somebody whom he knew per-

sonally and considered exceptional. None of our informants seemed to know any "average" old people.

To the constellation of characteristics, eccentricity, freedom from sanctions, and egocentricity, we first gave the name of "permitted deviance," because these are all traits which would be considered deviant in the middle years even if tolerated in old age. However, this is a misnomer if the aged are qualitatively different from the middle-aged, with norms and patterns of deviance of their own.

Reasoning that this appearance of deviance must have its source in decreased social control, we postulated that the crucial social-psychological differences between the middle-aged and the old lie along a dimension of social involvement, the middle-aged being fully engaged with life outside of themselves and the old relatively disengaged from it. The flavor of what we mean is given by Durkheim (5) when he says, ". . . society is still lacking in [the child], for it has not had the time to form him in its image; it begins to retreat from the [aged at the last confines of life] or, what amounts to the same thing, *he retreats from it.*" (Italics ours.) This process can be looked upon as having an inner and an outer aspect; that is, the disengagement of the individual from his social network is accompanied by certain inner changes. Three of our central hypotheses concerning the outer, or more social, aspects of the process are presented here.[2] The inner, or more psychological, aspects will be discussed elsewhere.

HYPOTHESES

Hypothesis I. Rate of Interaction and Variety of Interaction Will Lessen With Age

The emergence of eccentricities and the free expression of a certain self-centeredness must be related to release from the normative control of behavior provided by a wide variety and high rate of interaction with others. From the sociological axiom that norms are built and reinforced in interaction we can predict that interaction will be less in amount and smaller in variety among people whom others consider eccentric. We have developed two measures of interaction; the first, called Interaction Index,[3] an intuitive judgment, is based on the amount of each day spent in the kind of contact with others in which the hints, cues, and sanctions which govern and control behavior can be

[2] In this preliminary study, we have gone back and forth between our data and our conceptual structure because our purpose is to develop theory. Our findings are, therefore, expressed as hypotheses because of this circular procedure.

[3] The focus of this paper is the system of hypotheses which are the emergent substantive theory. Only a fraction of the available data is offered. The bulk of the data and detailed descriptions of the various measures used will appear in a book now in preparation.

TABLE 1

Rates of Interaction by Age and Sex

Sex and Age	Number Interviewed	Per Cent of Numbers Interviewed			
		Small Daily Interaction	Small Life Space	Small Number of Roles	Perceived Constricted Life Space
Both Sexes	211	51	51	58	65
50–54	36	28	14	39	39
55–59	34	38	29	38	56
60–64	34	41	32	41	47
65–69	30	53	67	60	70
70–74	51	65	82	78	84
75 and over	26	85	73	92	96
Males	107	51	37	58	65
50–54	19	21	5	32	37
55–59	18	44	0	39	44
60–64	19	47	16	53	42
65–69	11	46	64	46	82
70–74	26	65	77	81	89
75 and over	14	86	64	93	100
Females	104	51	64	59	66
50–54	17	35	24	47	42
55–59	16	31	63	38	69
60–64	15	33	53	27	53
65–69	19	58	68	68	63
70–74	25	64	88	76	80
75 and over	12	83	83	92	92

exchanged. Scoring was blind for age and was based on verbatim reports of the respondent's daily round of activities. Reliability between two scorers is .8.

Scores on this index of intensity of daily interaction have been classified as "high" or "low" for each of the 211 persons included in the study. The proportion found to have low scores as shown in Table 1 increases uninterruptedly with age from 28 to 85 per cent. There are no statistically significant differences between men and women in this respect.

A second measure of interaction, the Social Life Space Measure,[4] is achieved by an addition of scores on precoded questionnaire items regarding the total

[4] An early account of this concept of Social Life Space is given in: Williams, Richard H., and Martin B. Loeb, *The Adult's Social Life Space and Successful Aging: Some Suggestions for a Conceptual Framework*, a paper read to the Annual Meeting of the American Gerontological Society, 1956.

range of social interactions, such as those with family, friends, neighbors, fellow workers, fellow members of churches and organizations, and specific contacts with such people as store clerks and postmen. The score is basically the respondent's estimate of the numbers of interactions with different people which he engages in per month. It does not take account of the duration of these interactions. This score is not independent of the Interaction Index, which is, by contrast, heavily influenced by duration of interaction ($r = .6$), but it differs from it in being heavily influenced by variety.

The Social Life Space scores are also classified as "high" or "low," using the median of the total group as the point of separation. As shown in Table 1, the proportion with low scores varies with age from 14 per cent of those 50 to 54 years of age to 82 per cent of those 70 to 74 years old. This correlation with age is found for both males and females, although the proportion of females under 65 years of age with small life spaces is 46 per cent, as compared to only 7 per cent of the males of corresponding age. These findings suggest that men in the younger age groups have significantly more variety than women in their social interactions, although the total amounts of time spent each day in social interaction are not significantly different.

When the number of roles in which the respondents act is used as an index of social life space, we find that the percentage acting in few roles (less than six) also increases with age, with no statistically significant differences between males and females (Table 1).

Although these variations with age are, of course, not completely independent, they both are in accord with the theory so often implied in the literature in which the social structure is pictured as withdrawing from the individual, as well as with our own theory of the individual disengaging himself from the structure.

Hypothesis II. Changes in Amount, and Variety, of Interaction Will Be Accompanied by Concomitant Changes in Perception of the Size of the Life Space

In order to discover whether the respondent's perception of his own interaction rate coincided with the constriction we had discovered, we asked for a comparison of the present interaction rate with that remembered from age 45, and the question was repeated, with pre-coded answers, for all of the varieties of interactions used in the Life Space Measure. From these data we were able to construct another Index which we call Perceived Life Space, and on Table 1 we see that here too there is a shift with age, the percentage of both men and women seeing themselves acting in relatively constricted life spaces becoming greater in the older age groups.

It is, however, logical to enquire as to reasons other than mere age for the variations in perception of constriction. Accordingly, an attempt was made

TABLE 2

Perception of Constriction in Life Space According to Work Status, Sex and Age

Sex and Age	Number Interviewed		Per Cent with Perception of Constriction	
	Working	Non-Working	Working	Non-Working
Total Males	64	43	48	88
50–54	18	1	39	0
55–59	18	0	44	..
60–64	15	4	33	75
65–69	4	7	75	86
70–74	6	20	83	90
75 and over	3	11	100	100
Total Females	36	68	56	72
50–54	12	5	50	20
55–59	5	11	60	73
60–64	8	7	50	57
65–69	5	14	60	64
70–74	4	21	75	81
75 and over	2	10	50	100

to study the relationship of work status to this perception, although this is difficult since non-working men under age 65 and working men after age 65 are relatively few. The findings are presented, however, in Table 2. It is interesting that a considerable number, varying from 33 to 44 per cent of the men between 50 and 64 years of age, considered in five-year age groups, perceived themselves as acting in constricted life spaces, although still engaged in work outside the home. There is an abrupt and significant increase in this proportion at age 65 to the neighborhood of 80 or 90 per cent, *regardless of work status.* The interpretation of this abrupt change is not clear, but the smallness of the numbers certainly would indicate needs for further study before such a finding could be considered conclusive.

Comparable data are presented for the women in the group under study. The proportion of working women with a perception of a constricted life space hovers at about 50 to 60 per cent throughout the life span of 50 to 80, whereas the non-working women seem to experience a gradual increase with age. If it is assumed that the majority of these women were housewives who had not engaged in outside work, these findings, together with the fact that perception of constriction may occur even while a man is working, may support our central hypothesis that factors other than work in itself are involved in the increase in perception of constriction associated with age.

We turn now to marital status. Because we have small numbers, we have grouped the data. The two younger age groups are considered together, and the widowed are grouped with the divorced, separated and single, as shown in Table 3. Of the total number of 76 non-married respondents, a little more than half are 70 or more years old. *Only* four in the 70 and over age group have never been married, as compared to one-third of the 35 non-married respondents who are 50 to 69 years old. There is an apparent tendency for the non-married to have slightly higher rates of constriction than the married in corresponding sex and age groups, but this is not statistically significant and could, in fact, be explained by the slightly older ages of the non-married as compared to the married within each age group.

We find, overall, that there is no evidence that marriage is a significant variable for the occurrence of the sensation of constriction in life space among this group of respondents.

An attempt was also made to determine whether or not there are perceptions of constricted life space associated with reductions in family size. In the absence of easily available information on reduction in family size, present household size was used with the assumptions that (a) married persons living in two-person households would include families reduced in size by the separa-

TABLE 3

Perception of Constriction in Life Space According to Marital Status, Sex, Work Status and Age

Sex, Age and Work Status	Number Interviewed		Per Cent with Perception of Constriction	
	Married	Other	Married	Other
Total Males	86	21	62	76
Working	53	11	47	55
50–69	48	7	42	43
70 and over	5	4	100	75
Non-Working	33	10	85	100
50–69	11	1	73	100
70 and over	22	9	91	100
Total Females	49	55	61	71
Working	16	20	56	55
50–69	14	16	50	56
70 and over	2	4	100	50
Non-Working	33	35	64	80
50–69	26	11	58	64
70 and over	7	24	86	88

tion of children from the households of their parents and (b) one-person households might include those persons whose families had been reduced by the death of a spouse as well as unmarried persons whose families had been reduced by the death or separation of parents or siblings. Effects of loss of family members presumably might be expected to be reflected in differences in the rates of perceived constriction in these groups. Married persons, however, in our population live mostly in two-person households; married persons living in larger households, presumably more representative of intact families, generally are too few for meaningful comparisons by age and sex. In fact, there are only two married women over 55 years old who live in households of more than two persons. Similarly, one-person households representing the loss of a spouse are concentrated in the older age groups, where perceived constriction appears to be almost universal. However, five of the eight married women in their early fifties in two-person households do have perceptions of constricted life spaces, as compared to none of the six women of comparable ages in larger households. The probability of a difference as large as this with such small numbers is .04, but this finding is of the order that we would expect if a perception of constriction is likely to occur with the separation of children from their parents when they marry or leave home for other reasons. It is not a new observation, of course, that loss of family members may affect women in a way similar to that in which retirement is believed to affect men. There is not sufficient evidence in these data to support the hypothesis that either loss of family members or retirement are important factors in the perception of constricted life spaces, but our findings do suggest that these hypotheses may be worth pursuing further. Our interest in this paper is primarily focussed upon that shift in perception of social life space with age which seems to persist in all groups.

When we consider both perceived and actual life spaces, an interesting process is suggested such as might be found if a group of people were studied on a longitudinal basis from age 50 throughout the rest of their lives, somewhat as in a life table. Perception of constriction appears to come before actual constriction. Among the 107 men included in the study, there appears to be a gradual shift with age through three stages: (a) working, large life spaces, and no perception of constriction, to (b) an intermediate category in which there is a perception of constriction, continuing employment, and a large life space, to (c) a final stage of not working, a small life space and a perception of constriction. As shown in Table 4, the first two stages are found in the 50 to 59 age group in the proportions of 57 and 41 per cent, respectively; the final stage of not working, small life space and perceived constriction increases markedly with age: 30 per cent of those between 60 and 69 and 65 per cent of the oldest group have reached the final stage. In this oldest group, 18 per

TABLE 4

Work Status, Life Space and Perception of Constriction in Life Space According to Sex and Age

Sex and Age	Number Interviewed	Per cent of Number Interviewed				
		Working with Large Life Space		Not Working with Small Life Space		
		Perceived Unconstricted	Perceived Constricted	Perceived Unconstricted	Perceived Constricted	Other
Total Males	107	31	28	4	33	5
50–59	37	57	41	3	0	0
60–69	30	37	27	3	30	3
70 and over	40	3	18	5	65	10
Total Females	104	15	17	16	46	5
50–59	33	24	27	18	24	6
60–69	34	18	18	21	38	6
70 and over	37	5	8	11	73	3

cent are in the intermediate stage and only 3 per cent are still in the beginning stage of working within large life spaces without perceived constriction.

A similar process is observed among the 104 women included in the study, except that an alternative beginning stage of small life spaces without perceived constriction is observed. The small life spaces in this instance are associated with women who are not working. There are relatively few men in this category.

In summary, we may say that the middle-aged state is that of working in a large life space (or a small space for women at home), and perceiving it as stable, while the aged state is that of working in a small space and perceiving it as constricted. Logically, there could be two pathways toward the aged state: either the person can experience the sensation of constriction before constriction actually occurs or he can act in a small life space before he perceives the constriction. There is no evidence of the second pathway in these data, since most of the perceived unconstricted small life spaces appear to be associated with housewives. It is possible, however, that such a pathway does exist, but that the duration of this state is so short that it is unlikely to be picked up in this type of study.

If it is assumed, as seems reasonable from these findings, that the commonest pathway to the aged state is that of first perceiving a shrinkage of the life space, then we raise the question of the nature of this change in perception. It seems quite possible that some anticipatory socialization is occurring among these people and they are, as it were, looking ahead to a time when they will be less involved than they now are; that they are practicing for old age.

It is also possible that there is a process which is more purely "psychological" in nature which we can call "withdrawal of object cathexis." [5] Thus, if interactions are experienced less intensely and seem less important, they may be reported as fewer. This concept is not incompatible with the fact that the reported constriction may be partly accounted for by retirement and loss of members from the home, and it is compatible with the finding that the perception of constriction occurs persistently with age regardless of the other variables. It is not beyond the realm of possibility that there is some intrinsic change with age, which is the analogue of maturation in children, which results in this loss of involvement, or disengagement from the environment. This process may be hastened by a withdrawal of the environment, but until we have explored further we cannot rule out the possibility of an inner change. In fact, certain work with very old people suggests that this may be so. Cosin (6) expresses the opinion that ". . . deterioration of 'communications' through declining mental and physical abilities is not the main source of senile failure, but . . . more basic personality functions described in terms like 'drive' and 'self-motivation' have become defective." At any rate, as we can see from our table, the disengaged state, as we have defined it, appears to be an almost universal end point, and if it is a responsive phenomenon, it appears to be irreversible.

We now turn to another, and somewhat different aspect of the aging process, the shift in the quality of interaction.

Hypothesis III. A Change in the Quality of Interaction Will Accompany Decrease in the Social Life Space, from Absorption with Others to Absorption with Self, and from Evaluative to Carefree

Because we cannot observe our respondents in interaction, and must infer what we know about them from interviews, we have employed a classification of set-toward-interaction, using the typology of relational rewards which Parsons developed from two of his pattern variables (7), *diffuse vs. specific* and *affective vs. neutral*. The following are summary descriptions:

1. A diffuse-effective set toward interaction carries the expectation of potentially unlimited mutual obligation and affection, and the anticipated relational reward is unconditional acceptance, or *love*. The nuclear family is the ideal type.
2. A diffuse-neutral set toward interaction carries an expectation of potentially unlimited mutual obligation, but no expectation of mutual affection. The ideal type occurs in such goal-directed collectivity as a union, a charitable organization, or a fraternal order. The anticipated relational reward is *esteem*, and the tone is moral and evaluative.
3. The specific-affective set toward interaction carries the expectation of short-run gratification. The anticipated relational reward is *responsiveness* in the immediate sit-

[5] A direct measure of this process is being developed.

uation. It occurs in any interaction undertaken purely for recreation; it can be called a hedonistic set.

4. The specific-neutral set toward interaction carries the expectation of adequate mutual performance toward a goal apart from the interaction itself; no emotional gratification is involved. The ideal type is work and the contractual world. The anticipated relational reward is *approval*.

It is obvious, of course, that everyone must have all of the sets toward interaction in his repertoire, but for our purpose, it is a shift in primary style associated with age with which we are concerned at this time. Our respondents were read descriptions of these relational rewards and asked which one they thought they sought primarily and then which one they felt they sought secondarily.[6]

The carefree egocentricity of the very old, which our initial inquiry revealed, suggests that the process of disengaging will involve a move toward a specific-affective set toward interaction, possibly through a redefinition of existing relationships. In other words, to reach the disengaged end-point, relationships will be redefined so as to be less like those of family, work, and voluntary associations and more like those of the world of recreation. Stated still another way, approval and love and esteem-seeking should characterize a large number of our younger panel members, and response-seeking should characterize the older ones. Examining the responses, we find that no significant differences between the men and the women could be detected, and therefore the men and the women are not shown separately in Table 5.

When we examine this table, we see that working makes a big difference to the nature of the interpersonal reward sought. Among the workers, the predicted drop in approval-seeking is very striking, dropping from 61 per cent among the youngest age group to 18 per cent among the oldest. The three other response categories share a corresponding increase in the over-seventy age group, but none of the three is significantly increased. Conversely, among the non-workers there is a significant decrease with age in love-seeking and an increase in all other categories. Again, the increase in none of the three other categories is significant.

Although our hypothesis that approval and love, the typical rewards of work and kinship, would tend to disappear with age is upheld, a good deal of caution is needed in interpreting the results. These data were collected at the third interview and there was a 22 per cent overall loss of cases through deaths, removals, and refusals. In some categories the losses are nearly one-third of the total. However, we can hypothesize for future testing that approval and love seeking, respectively, the appropriate rewards of the instrumental and socio-

[6] Intensive interviewing of ten respondents satisfied us that they understood these terms and discriminated between them.

TABLE 5

Type of Primary Rewards Sought in Interaction According to Work Status and Age

Work Status and Age	Number Interviewed	Per Cent of Number Interviewed			
		Approval	Esteem	Love	Response
Total	164*	38	21	23	17
Working					
50–69	71	61	20	16	4
(50–59)	45	62	16	18	4
(60–69)	26	58	27	12	4
70 and over	11	18	27	27	27
Non-Working					
50–69	36	17	17	44	22
(50–59)	13	23	15	46	15
(60–69)	23	13	17	44	26
70 and over	46	26	26	17	30

* Exclusive of 47, or 22 per cent of the total group under study, who had died, moved or refused the third interview.

emotional worlds, fall off with age and a new freedom of choice of relational rewards emerges. This finding supports the hypothesis of idiosyncratic behavior among the aged.

The hypothesis of a more carefree manner among the old, which our initial impressionistic analysis generated, is lost. We should say, however, at this point, that this says nothing about the *morale* of the older group, a matter to which we have not addressed ourselves in this paper. Our own findings, to be published elsewhere, and those of Streib (8) and others, suggest that there is no loss of morale associated with either age or retirement.

SUMMARY

We have developed a tentative theory of aging in which a disengaging process, which may be primarily intrinsic, and secondarily responsive, leads to a disengaged state. The individual is pictured as participating with others in his social systems in a process of mutual withdrawal, rather than being deserted by others in the structure. From our initial study we hypothesize that, in the modal case, disengagement begins during the sixth decade with a shift in self-perception which may reflect both a withdrawal of object cathexis and a beginning of anticipatory socialization to the aged state. This shift in perception is accompanied by a constriction in the variety of interactions undertaken, and is followed shortly after by a reduction in the number of hours of each day which are spent in the company of others. Finally, there may occur

some shift in the quality of interaction with others, the aged group choosing a wider variety of relational rewards than the middle-aged. The result of the disengaging process is a more self-centered and idiosyncratic style of behavior among the ambulatory aged.

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REFERENCES

1. Plato, *The Republic*, Book I.
2. Riesman, D., *Individualism Reconsidered*, Glencoe, Illinois: The Free Press, 1955, p. 484.
3. Erikson, E., *Childhood and Society*, New York: W. W. Norton & Company, 1950.
4. Kutner, B. and Associates, *Five-Hundred Over Sixty*, New York: Russell Sage Foundation, 1956.
5. Durkheim, E., *Suicide*, Glencoe, Illinois: The Free Press, 1951, p. 215.
6. Cosin, L. et al., "Experimental Treatment of Persistent Senile Confusion," in *International Journal of Social Psychiatry*, 1959, 4, p. 41.
7. Parsons, T., *The Social System*, Glencoe, Illinois: The Free Press, 1958, p. 130.
8. Streib, G., et al., *Journal of Social Issues*, 1958, 14. (Entire issue.)

Quiet and Vocal Groups [1]

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There is a rapidly growing body of research on the influence of group structure on group identification and performance. Emphasis on leadership training has focused attention toward the differential effects groups have on the attitudes and behavior of individual participants. Of particular interest to clinicians and psychologically oriented researchers is the relationship between the effectiveness of the group in influencing individual behavior change and the personality characterictics of those individuals. More recently the question has arisen as to whether groups of individuals "compatible" or "incompatible" in terms of certain personal characteristics are more effective in solving problems.

The present study is concerned with two questions of significant theoretical and clinical interest emerging from these lines of research:

1. When compatible groups of quiet and vocal members are assigned similar tasks, what are the effects in terms of membership satisfaction, group identification and performance?
2. Will assigning members who are low-verbal in behavior to groups compatible in terms of verbal ability lead to an increase in their verbal behavior in these and other groups?

The first question, which concerns the relative effectiveness of vocal and quiet groups in problem solving, is of considerable interest, since several researchers have found that verbal output is significantly related to leadership status as measured by peer or observer judgments (1, 2, 3). Bass, for example, found a correlation of .93 between the time a member of a leadership group spent talking and the votes he received from observers for having demonstrated leadership. Caudill noted a similar correspondence between the evaluations given resident physicians by their senior officers in a mental hospital and verbal participation in staff meetings (4, p. 252). From a peer judgmental point of view, then, grouping members in terms of their verbal output may mean grouping them in terms of leadership status as perceived by themselves and their peers. What effect does this have on group functioning, membership identification and performance?

The second question, which is concerned with increasing the participation of non-vocal group members, deals with a problem that has baffled many

[1] This paper grows out of a project made possible through support from the Russell Sage Foundation. A creative discussion with Beryl Roberts and William Griffiths yielded the idea for the project. They and Harold Gustafson also served as consultants to the sessions. The author wishes to thank Ann Haynes, Sarah Mazelis, and Marguerite Augustine for evaluating the final reports, and especially the students exposed to the stressful experience.

leaders in group process. Educators and therapists alike tend to feel that active participation is necessary for individual growth in the group situation. Their feelings are supported by much clinical and theoretical evidence and by some research (5, 6, 7).

While some group leaders and therapists make special efforts to bring the non-verbal member actively into the group as early as possible, so he may profit from his experience, others seem to feel that certain individuals are emotionally oriented in such a way that they will gain little from the group experience. Stock and Thelan, along with Mathis, have been concerned with developing a trainability index, to apply in screening out individuals who are not likely to profit from the group process experience (5, pp. 150–156).

How to assure that every member of a group process class has a profitable experience becomes a matter of real concern, when it is not possible to select out those who tend to be passive group members, and where the experience in the group is an important part of the educational program.

The Setting

Two laboratory courses in the School of Public Health provided an ideal situation in which to investigate these questions. The student body included 31 Master-of-Public-Health candidates who were concurrently enrolled in the group process laboratory and the mass communications laboratory. While all members of the group had had some orientation in the behavioral sciences, the range among members was from a single elementary course to a Master's degree in anthropology. All students had had at least two years' experience beyond the baccalaureate degree in some field of public health. Several held doctoral degrees. Ten were foreign students, some of whom, while able to speak English, were not expert in the language and hence, perhaps, insecure in the group situation.

The group-process laboratory was organized into three separate sections—each with a faculty member serving as a non-directive consultant. At the time the study was initiated, six weeks after the beginning of the course, it had been observed that in each section a few members of the group were low participants, whereas some members were very active participants. The low-participant group was of primary concern to all consultants who wished to find some way of bringing them more actively into the group.

The mass-communications laboratory, in which the students were concurrently enrolled, was organized in such a way that small groups were used from time to time for the purpose of working on specific research problems. For each project, a different pattern of small-group organization was used so that all members of the class could become closely acquainted with one another and use fellow members as resource persons. It was observed that the same mem-

bers who were low participants in group process also tended to be low participants in the communications laboratory sessions.

The experiment was initiated to test whether regrouping the students according to verbal ability for work in the mass-communications laboratory would help to solve the problem of non-participant behavior. The regrouping was to be tried out experimentally over a three-session period to see whether it would bring the non-verbal members more actively into the discussions. At the time this approach was initially considered, the possibility of measuring the relative production of the four groups was not recognized. Fortunately, however, the tasks were similar and were randomly distributed among the four groups, so that the measure of productivity could be included in the research, this possibility having been recognized at the first session of the groups.

The three faculty members responsible for the two courses participated in ranking students in terms of their verbal fluency as judged by participation in the two laboratory courses. Students were assigned to four groups, three of seven members each and one with ten members. Little difficulty was experienced in first splitting the total group into a quieter group and a more vocal one, and the faculty agreed that the least vocal member of the more vocal group was more verbal in behavior than the most vocal member of the quieter group. Agreement was also reached in separating out the most vocal members of the vocal group and in separating out the very quiet members of the quiet group, but these decisions were more difficult to make. Therefore, some overlapping between the two vocal groups and some overlapping between the two quiet groups may have occurred.

Several minor changes were made in the distributions to assure equal representation in terms of foreign residence and intellectual ability insofar as this could be judged. Information available for judging intellectual ability included grades in previous courses and on the papers submitted during the school year. Honor students and other students were about equally distributed among the four groups; there was no evidence of intellectual superiority for members of any one of the four groups. It was later possible to check these groups against final grades available for the year.

The Task

The purpose of the communications laboratory sessions used for the experiment was to provide experience in the pretesting of a public health pamphlet. This was a topic of considerable interest to the group. The content materials were four pamphlets prepared for public distribution by the California State Health Department. The Department planned to revise these pamphlets and the students were advised that any suggestions coming out of their studies would be considered in preparing the revision. Insofar as could be judged, the

pamphlets provided an equal opportunity for carrying out the task designated for the three-week group session. The pamphlets were randomly distributed, with each group responsible for the pretest of one of the four pamphlets. The instructions were as follows:

> A. Outline a preliminary plan for making a pretest of the public health pamphlet assigned to your group. Then try using your exploratory pretest on at least one person prior to coming to class. Come to class prepared to use these exploratory findings in working with other members of your group in completing a sound pretest plan.
>
> B. Complete pretest of the pamphlet using the plan developed in class. Hand in a brief written report of your findings and what you have learned using this approach.

Several references on methods of pretesting had been provided prior to making this assignment (8, 9, 10, 11). Once the assignment had been given, the class was broken up into the four groups. Four faculty members served as nondirective resources to the groups. The groups were advised that this was a three-week group assignment, and that group reports were desired.

Group Reaction to the Task

Initial reactions of members of the four groups to the group placements were a surprise to the faculty. In the very quiet group, the members seemed astounded to find themselves together without a vocal member. Members of the group kept their eyes on the distributed written assignment and no one spoke for fifteen minutes: after the project, one member observed that he had timed this first interval of silence as seventeen minutes long. The first member of the group to raise a question concerning the task was looked to as leader. During the first session, this group was very slow in moving, and seemed to ponder endlessly over the mechanics of getting started. Following the session, the group leader sought consultation on how to be a leader. It was the first time this person had found herself in a leadership role, and she was quite disturbed that she did not know how to handle the role.

On the other hand, the very vocal group set immediately to the task and scarcely took the time to read the assignment or consider its meaning. They moved along rapidly, competing with one another for leadership. Good suggestions may have been lost because of the eagerness of the group members to express their individual points of view.

The degree of active participation in other groups also seemed to be related to the group's ranking as to verbal facility.

Hypotheses and Research Questions

It was recognized after the first session that the group reports would provide objective evidence of achievement, so that a comparative evaluation of group

performance could be made. The opportunity for research was unique, since the groups were closely matched except for the variable "verbal fluency" and such unknown factors as might be related to it, and also since similar tasks were performed by the different groups.

The behavior of the four groups, as observed during the first session, was in the direction expected—the quiet groups were quiet and the noisy groups were noisy—but the degree of the difference between the quiet and verbal groups was more marked than had been anticipated. To understand the situation it was necessary to learn how the participants perceived the experience, and their attitudes regarding the experience. Several hypotheses were posed and plans were made to test these hypotheses systematically.

It was hypothesized:

(1) The members of the more vocal groups would be happier with their group assignments than would members of the quieter groups. The research question posed was: How did members of the different groups react to their being included in the particular group to which they were assigned?

(2) That members of the more vocal groups would be more satisfied with their early progress than would members of the quieter groups. Overt differences in group behavior had been observed, as already mentioned, and it was expected that these would be reflected in the feelings of the members. The research question posed was: How did members of the different groups evaluate their own progress during the initial session?

(3) That members of the more vocal groups would be more satisfied than members of the quieter groups with their production, participation, leadership, and group spirit, and hence with their evaluation of the total experience. It was hoped that this would be a good learning experience for all, but it was expected to be particularly good for members of the quieter group. The research question posed was: How did members of the different groups evaluate the total experience?

(4) That there would be no systematic difference between the groups in the quality of the task performance. The research question posed was: How did the groups compare in terms of the quality and usefulness of the product produced?

(5) That the nonparticipating members in the group process laboratory would profit from the experience of being put in a group with others of his own kind where he would be forced to take a more active role, and that this would lead him to take a more active role in other group situations. The research question posed was: What changes in group behavior were observed following the demonstration for the experimental project?

Method of Collecting Data

The data were collected by means of a questionnaire at the first class session following the end of the project. At this session three members of the group were absent and, since it was not desirable to obtain these data at a later date, the final groups included in the study consisted of ten for the most vocal group and six for each of the other three groups.

The first page of the questionnaire included three questions concerned with attitudes toward the group assignment. These were open questions, and the group was asked to complete this page of the questionnaire before looking at the remaining questions. Cooperation was excellent. Every member completed every question adequately from the standpoint of analysis. The group was advised that it would receive a feedback of the findings of the study and an explanation of its purpose at a later date.

FINDINGS

Hypothesis 1

It was hypothesized that members of the more vocal groups would be happier in their group assignments than would be members of the quieter groups. Data were therefore gathered regarding the reactions of the members of the different groups to their assignments. These data have been summarized in Table 1.

Subjects were asked, "How would you describe this group to someone who was not present?" In response to this question, nearly all the members of the most vocal group and the next most vocal group expressed satisfaction and indicated strong positive reaction to other group members. On the other hand,

TABLE 1

Reaction to Group Assignment by Members of Quiet and Vocal Groups

	Very Vocal Group	Vocal Group	Quiet Group	Very Quiet Group	Significance *
Q2. Description of own group membership					$P<.01$
Very positive terms	8	5			
Indifferent or neutral terms	2	1	2	3	
Negative terms			4	3	
Q3. Satisfaction with group assignment					$P<.01$
Satisfied, pleased	9	6	1	1	
Indifferent, dissatisfied	1	0	5	5	
Q4. Group preference					$P<.01$
Preferred own group to other groups	10	5	2		
Preferred own group, but defensive	0	0	2	3	
Preferred other group to own group	0	1	2	3	
Number in group	10	6	6	6	

* For purposes of testing significance of differences, the two vocal groups were combined and the two quiet groups were combined, since the individual groups were small. The median test was employed.

the members of the quiet and very quiet groups tended to be either indifferent or negative in their reactions.

The terms used by members of the most vocal group to describe their fellow-members included, "a group of possible leaders who might have bogged down because of competition for leadership, but didn't," "quite cohesive," "active, ambitious, task-oriented, cooperative, industrious, scholarly," "cooperative, cohesive, easy to work with," "quite verbal, active, jovial, cooperative, strong, made up of people who represent the kinds of power," "one of the most active and effective groups," "capable, highly motivated people with good intellectual capacity," "most verbal members of the class," "the cream of the crop in terms of positive and effective contributions."

The terms used by the members of the quiet group to describe their fellow-members were far less self-laudatory. The most favorable observation was, "It was a nice group who worked together and found out many good points;" others described themselves in more timid terms; "generally of the milquetoast variety," "nonparticipators," "reluctant of the entire problem," "slow in getting started," "most verbally reticent members."

Members of the quiet group tended to compare themselves in terms quite similar to the very quiet group; likewise, members of the vocal group tended to describe themselves in terms somewhat similar to those used by the very vocal group.

In response to the question, "How did you feel about being assigned to this group?" nearly all members of the two most vocal groups expressed high satisfaction with the assignment. They said it was fine, the best group they had worked with; they felt comfortable, found it challenging, were pleased to be in it, and enjoyed it.

In contrast, the members of the quiet and very quiet groups did not like to be considered as "reticent," wondered why everybody seemed to be of the same caliber, felt that the group had been assembled to represent the more reticent, asked if the assignments were loaded and "wondered why I had been grouped with these. . .," "was this the mousiest, or what?" Two members were somewhat apologetic: "no unusual feeling, the personalities were adequate," "one group is as good as another—no real anticipations or disappointments."

The vocal and very vocal groups were almost unanimous in responding "no" to the question, "Would you rather have been placed in some other group at the time?" On an open question, they backed up their response with the reaffirmation of their satisfaction with the opportunity of working with the group in which they were placed.

Members of the quiet and very quiet groups were about evenly split in their responses to the question regarding their preference for some other group. In the open question following, even those who said "no" (they would not have

preferred some other group) indicated that they were not wholly satisfied, but felt that it was a reflection on the group to speak otherwise: "Nothing against any of the members, but I thought the group could have been divided a little more equally," "No, because I felt *any* group was worth my effort," "No, I felt this was a good working group, though some more aggressive individuals were in others," "No, having worked previously with other members, their traits and characteristics were acceptable," "No, at first I was perturbed, but . . ."

Thus, data from all three questions tends to support strongly the hypothesis that members of the more vocal groups were happier with their group assignments than were members of the quieter groups. The responses of members of both groups suggest a value placement upon verbal facility, and identified the more vocal groups as groups of greater status.

Hypotheses 2 and 3

It was hypothesized that the vocal groups would be more satisfied both with their first session and with their total experience during the project than would members of the less vocal groups. It was expected that they would be more

TABLE 2

Self-Evaluation of Project by Members of Quiet and Vocal Groups

	Median Rankings of Members				
	Very Vocal Group	Vocal Group	Quiet Group	Very Quiet Group	Significance *
Production of group †					
During 1st session	6	5.5	3	2	$P<.01$
During total project	6	6	3.5	5	$P<.01$
Satisfaction with own participation					
During 1st session	5.5	5.5	3	3.5	$P<.01$
During total project	5.5	6	4.5	5	$P<.05$
Satisfaction with leadership	5.5	6	3	4	$P<.05$
Value of project as learning experience	5	5	5	6	N.S.
Prefer own group for another project	5	5	4.5	4	N.S.
Number in group	10	6	6	6	

* See footnote, Table 1.

† Rank of 6 indicates most productive, most satisfied, most successful and preference of own group to any other. Rank of 1 indicates least productive, least satisfied, least successful, and preference of other group to own group.

satisfied with their production, their participation and their leadership, and would prefer to work with the same group on other projects.

Table 2 summarizes the data from seven questions used to obtain the reactions of the groups in terms of these factors. It will be noted that the vocal groups were more satisfied with their own participation and with their leadership than were members of the quiet groups. In response to a question concerning the choice of groups for another project, there was a tendency for members of the more vocal groups to express a higher preference for their own group than for some other group, but the differences were not significant.

It will be recalled that the initial purpose of the project was to provide a new type of learning experience for members of the quiet groups. All members of the very quiet group rated the project as their most successful learning experience. Members of the other three groups also rated it very high as a learning experience.

The reactions to these questions tend to support hypotheses 2 and 3 in that the more vocal groups tended to express greater satisfaction with their production, participation and leadership. It tends also to support the hypothesis regarding the success of the project as a learning experience for the quiet groups, as judged by personal ratings. An individual's own estimate of learning may not, of course, be supported by other data.

Hypothesis 4

It was hypothesized that there would be no difference in the quality of task performance by the four groups. This hypothesis was not strongly expressed because there was some feeling among the faculty that the more vocal groups might turn out better products.

Each of the four groups completed a plan for pretesting the pamphlet assigned to them, carried out this plan, and prepared a report of findings and recommendations. Members of the staff felt too deeply involved in this project to make a valid judgment as to the quality of the final reports. Outside evaluation seemed indicated. Accordingly, the Chief of Health Education in the State Health Department was requested to assign this responsibility to two top members of her staff. These members were asked to rank the group reports in terms of the quality and usefulness of the product.

Before the reports were submitted for evaluation, all personal references were removed. Furthermore, in order to make the reports appear as similar as possible, they were put in like folders along with a copy of the pamphlet subjected to pretest.

The findings of these consultants are presented in Table 3. Their independent rankings were similar, and in full agreement with the expectations of members of the staff after they had looked over the papers. The quiet and

TABLE 3

Consultants' Rankings of Groups in Terms of Quality and Usefulness of Product *

	Very Vocal Group	Vocal Group	Quiet Group	Very Quiet Group
Consultant A	1	2	3	4
Consultant B	1	2	4	3

* Highest ranking (4) indicates best quality and usefulness.

very quiet groups had produced the most integrated reports, and these reports reflected careful thought and planning. They also reflected an organized and interrelated approach to the gathering of essential data and to the drawing up of pertinent conclusions. This was less true of the reports of the vocal groups. The very vocal group revealed in its report the degree to which competition for leadership and individual expression must have influenced its group process. The report lacked co-ordination. Included in it was a page of the personal observations of each member of the team; members of the group had failed to reach complete agreement and each may have felt the need for personal identification with the part of the final product to which he had contributed.

Hypothesis 4 is, therefore, not confirmed. There was a distinct difference between the less vocal and more vocal groups in terms of the quality of performance.

Follow Up: The Feedback

There was considerable concern among members of the faculty as to how these findings should be reported back to the class. After discussion, it was agreed that the best thing to do was to present the data straightforward, with the expectation that the more vocal members would be able to handle the situation. Accordingly, a feedback situation was planned in such a way that the individual groups could meet immediately after the feedback to discuss among themselves, with no one else present, the implications of the findings.

The more vocal members of the group were highly satisfied with the early findings of the study. The less verbal members were somewhat embarrassed to find that they had described themselves in this way, and yet they found others in sympathy with their descriptions.

When the findings from the evaluation of the final report were presented, the vocal groups were stunned, and could scarcely believe what had happened. The discussions that followed continued for about an hour. Members of the faculty were not present at these sessions, but they gradually received "feedback."

At first, many members of the vocal groups rejected the findings outright. Later, several of them came to look over the papers and draw their own conclusions. It appeared that no one in the most vocal group had read the complete report as it was turned in. Each member had been responsible for a part, but no one had taken the role of co-ordinating. They became fully aware in their discussions of the lack of co-ordination between their findings and reporting. The quiet groups, on the other hand, were pleased with themselves and with the considerable status achieved in the total group.

During the several weeks following the experiment, it was observed, both in the group-process laboratory and in the communications laboratory, that members of the more vocal groups were less active participants in the discussion and, during this short period of time, several members of the quiet groups assumed leadership roles. These roles were not given up when the vocal members recovered and started to take more active parts. By the end of the year, several members of the quiet groups had assumed active leadership roles in various activities of the school. The long-term effect on the more vocal members of the class was less observable.

Discussion

Findings concerned with the relative effectiveness of quiet and vocal groups in performance of the present task, while interesting, cannot safely be generalized to other situations. There is need for replication of the study, using different tasks and a control group or two including both quiet and vocal members. Such a study might be focused toward learning under what conditions, and with what tasks, quiet groups function more effectively than vocal groups; with what kinds of problems the reverse occurs; and when the heterogenous group is more effective.

Several avenues of research are suggested by the fact that the findings regarding performance are in conflict with what seems to be a generally held norm, that vocal members function more effectively than quiet members (12, 13). Riecken's research on this problem shows a tendency on the part of the group to rank a high-talking member as having contributed more than a low-talking member, even when the group accepted the solution of the low-talking member (13). Does holding such a norm influence the levels of aspiration of quiet and vocal group members? Does it influence their self-images as group members? How is performance in this situation influenced by expectation? If the project had been perceived as competition between groups, how might this have influenced the findings?

Of particular interest are questions this study raises regarding the concept of leadership as it applies in small group situations. The data support the viewpoint that leadership in groups is neither a unitary quality nor a set pat-

tern of role behaviors that apply similarly in all situations. Rather, a particular type of group seems to require for its direction a certain pattern of leadership roles and individuals with both the abilities and initiative to carry out these roles. The leadership characteristics required for effective group functioning may not be the same for all groups. Successful leadership in a very quiet group seems to require a set of leadership characteristics different from those required for effective leadership in a very vocal group.

Ordering the groups in terms of quiet and verbal members selectively removed persons with certain verbal leadership qualities from the quiet groups. Their absence was immediately apparent, for the group could not move toward its goal until some member stepped forward to fill the verbal leadership role.

The vocal group had an abundance of members with verbal leadership qualities but seemed to lack members able and willing to perform other leadership roles. Verbal fluency seemed to be identified as the *sole* mark of leadership. No one took responsibility for recording suggestions and decisions, for summarizing discussion and reviewing progress, for planning the report, for co-ordinating the ideas and findings of others in preparing the final report. The present study does not tell us whether the qualities necessary for performing these leadership functions were lacking, or whether the high premium placed on verbal leadership resulted in these other roles being ignored.

The two groups seem to have had different types of leadership needs. The retiring members comprising the quiet group needed a leader capable of eliciting their ideas without threat and helping them to move with security. The fast speaking members of the vocal group needed a leader who could hold them back until sound decisions were reached, help them to evaluate progress and make necessary changes in plans, co-ordinate ideas and findings, and make sure that an integrated product resulted.

To the extent that this observation holds, it may have significant implications for leadership selection and training. Is it reasonable to expect the same group leader to perform effectively the two different sets of roles described above? Should recognition of the leadership needs of different types of groups be included in leadership training courses? Should leaders in training be provided with opportunities for experience in groups of various composition, and concerned with different types of problems, so they will learn to identify the special leadership requirements of different situations?

The initial reaction of group members in identifying verbal fluency with leadership is consistent with findings already mentioned. Discussion with students after the experiment suggests that they believed this was a norm held by both peers and faculty. Being identified with the quiet group tended to be damaging to the ego; being identified with the vocal group seemed to be ego-enhancing.

The study suggests that some quiet and some vocal members held unrealistic self-images in the group situation before being assigned to a group similar to themselves in behavior. Several quiet members later expressed the opinion that they had felt shocked to find themselves grouped with persons they had seen as quiet and retiring. They had not previously identified themselves as quiet in the group situation. The experience must have been particularly disturbing for those members of the quiet group with leadership strivings. The experience of being so grouped seems to have shocked them into a more realistic perception of their own behavior patterns, and led them to take steps to change. Further research may provide additional information on the value of this type of approach in influencing behavior change. It may identify also other means available in the teaching situation for reality testing with respect to self-image.

The value of the present research would have been greatly enhanced if it had been possible to obtain some measure of self-image prior to the experiment, so that a more objective estimate of change could have been obtained. An objective index of verbal behavior for use in grouping members would be an improvement over faculty rating which, while successful in this particular situation, might be more difficult to carry out with agreement in other situations. It would have been also most desirable to have a large number of groups, including some control groups with heterogeneous distribution of quiet and vocal members. Measures of aspiration and expectation regarding performance would be of interest, but obtaining such measures would probably introduce the factor of competition, which did not seem to play a role in the present research. A replication of the study with such improvements in design would be useful in answering some of the questions posed regarding the relative effectiveness of quiet, vocal and heterogeneous groups, and regarding the effects of assignment to such groups on self-image and behavior in other groups.

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1. Bass, B. M, "An Analysis of Leaderless Group Discussion," *Journal of Applied Psychology*, 1949, 33, 527–533.
2. Blau, P. M., "Patterns of Interaction among a Group of Officials in a Government Agency," *Human Relations*, 1954, 7, 337–348.
3. French, R. L., "Verbal Output and Leadership Status in Initially Leaderless Discussion Groups," *American Psychologist*, 1950, 5, 310–311.
4. Caudill, W., *The Psychiatric Hospital as a Small Society*, Cambridge, Mass.: Harvard University Press, 1958, p. 252.

5. Stock, Dorothy, and H. A. Thelan, *Emotional Dynamics and Group Culture,* N. Y.: New York University Press, 1958.
6. Shaskin, D. A., "Evolution and Trends in Group Psychotherapy," *American Journal of Orthopsychiatry,* 1948, 18, 447–454.
7. Perez, H., "An Investigation of Non-Directive Group Therapy," *Journal of Consulting Psychology,* 1947, 11, 4.
8. Knutson, A., "Pretesting; A Positive Approach to Evaluation," *Public Health Reports,* Reprint 3192, Washington, D. C.; Supt. of Documents, 1952.
9. Klare, G. R., and B. Buck, *Know Your Reader,* New York: Hermitage House, 1954.
10. "Pretesting and Evaluating Health Education," *Public Health Monograph No. 8,* Washington, D. C.: Supt. of Documents, 1952.
11. *Ten Check-points for Better Booklets,* New York: Council of national organizations, 1956.
12. Bales, R. F., "The Equilibrium Problem in Small Groups," in T. Parsons, R. F. Bales, and E. A. Shils, *Working Papers in the Theory of Action,* Glencoe, Ill.: The Free Press, 1953.
13. Riecken, H., "The Effect of Talkativeness on Ability to Influence Group Solutions to Problems," *Sociometry,* 1958, 21, 309–321.

Latent Motives, Group Discussion, and the "Quality" of Group Decisions in a Non-objective Decision Problem [1]

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One of the classic problems of group problem-solving research involves a comparison of the quality of group and individual decisions. It is well known that, provided the criterion involved is such that individual judgments tend to cluster around it with random errors (of whatever magnitude), averaging and majority decision procedures will tend to make group decisions more accurate on the average than individual decisions. Pooling of either sort reduces random variation around the criterion. In addition, Thorndike (4) and Timmons (5) have shown that the improvement of group over individual judgments is sometimes greater than would be expected simply through the effects of averaging and majority pressure.

The problems posed to the groups in such studies have generally had answers that were unambiguously correct within the framework of general scientific standards of proof. Usually this has meant mathematical or logical problems, although Thorndike included a number of judgments where correctness was defined in terms of ratings on the part of expert judges. As one explanation for the better quality of group decisions in explicitly factual questions, Thorndike suggested a distinction between the ability to devise a solution and the ability to evaluate a solution suggested by another, and argued that in such questions "there is a certain inherent logic and plausibility in the right choice which make it more possible to build up a good argument on that side" (4, p. 360).

The hypothesis that one of the factors involved in group decision-making is the evocation of alternatives (or other relevant considerations) that are easily recognizable as decisive by individuals who are themselves unlikely to discover them unaided appears also to have been made by Timmons. Similarly, data from Shaw's early experiments (3) indicate that effective discrimination between "correct" and "incorrect" suggestions offered in the group is a character-

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istic feature of group problem-solving. Thorndike suggested that this factor could operate only in problems similar to mathematical ones, where standards of proof are probably more widely shared than are inventive abilities. However, the rules of mathematical proof and inference are not necessarily more persuasive to group members than are other commonly shared norms concerning acceptable solutions to judgmental problems, and it is relevant to inquire into the "quality" of group decisions in areas that are traditionally considered non-objective, but in which there are shared judgmental norms.

It is reasonable to expect this to be particularly important where unconscious motivations are involved in individual judgments. Since shared latent motives will tend to be made manifest for all members of the group once they are manifest to any member, we predict that group decisions on problems involving unconscious motives will be more consistent with generally accepted social norms than will individual pre-interaction opinions, even after the effects of averaging and majority influence are eliminated. Since the hypothesized mechanism is not one of social pressure in the usual sense, we predict further that individual post-interaction judgments will also be more consistent with such norms than pre-interaction judgments.

A test of the hypotheses was made by asking subjects to rate the relative beauty of five females on the basis of a set of photographs and then to reach group decisions on a ranking. One of the five photographs was identified independently as appearing more overtly sexual than the others, and the differential treatment of that alternative by individuals and by groups was analyzed.

METHOD

Subjects and Materials

Seventy-one male undergraduate students were divided into ten five-man and seven three-man groups. The five photographs used were secured from a modeling agency, and were pictures of the head and shoulders only. One of the five was distinguished according to a criterion of apparent sexual availability (i.e., the probability of making a favorable response to overt sexual advances) in this way: Ten faculty members in the behavioral sciences were asked to rank independently the five photographs according to the "sexual availability" criterion. Their rankings indicated quite general agreement with respect to the most available female, but relatively little agreement as to the ordering among the other four. Specifically, the rankings showed significant agreement (concordance) by Kendall's test (*2*) so long as the highest ranking alternative was included. The level of concordance was not significant when the rankings of the other four photographs alone were considered. The highest ranking photograph thus identified is treated below as the critical alternative.

Procedure

Subjects were given a booklet containing the five photographs and asked to rank them privately according to a criterion of "beauty." No additional definitional help was provided either in the instructions or by the experimenter. Once the individual judgments were recorded, the experimental group was placed in a separate room and subjects were instructed to arrive at a ranking agreeable to all group members. The group sessions were observed through a one-way mirror, and this fact was known to the subjects. After the group reached a decision, the subjects were asked to record their post-interaction judgments.

Analysis

To compare pre-interaction individual ratings of the critical alternative defined above in terms of her greater apparent sexual availability and the treatment of the same alternative by groups and by individuals in their post-interaction judgments, we treat the rankings as four paired comparisons between the critical alternative on the one hand and each of the four alternatives on

TABLE 1

Effect of Pre-interaction Alignment on Group Decision, by Size of Group

Group Size	Pre-interaction Alignment of Group Members	Number of Times: Group Adopts Majority Position	Number of Times: Group Rejects Majority Position	Total	Per Cent of Times Group Rejects Majority Position
5	3–2 majority *against* critical alternative	9	0	9	0.0
	3–2 majority *for* critical alternative	4	5	9	55.5
	Total	13	5	18	27.7
3	2–1 majority *against* critical alternative	12	1	13	7.6
	2–1 majority *for* critical alternative	5	2	7	28.5
	Total	17	3	20	15.0

TABLE 2

Pre- and Post-Interaction Rankings of Critical Alternative by 71 Subjects

Ranks Assigned	Rank Assigned Prior to Interaction				
	I	II	III	IV	V
Rank assigned after interaction					
I	5	0	0	0	0
II	3	6	4	1	0
III	1	4	10	1	0
IV	0	2	6	10	2
V	0	1	2	4	9

the other. Since the groups, in general, tended to accept the pre-interaction position taken by a majority of group members with respect to these judgments, we wish to control for the effects of majority pressure and thus for the more standard forms of social pressure. Moreover, where the majority was 4–1 or 5–0 in the five-man groups or 3–0 in the three-man groups, the confirmation of the majority positions by the group was virtually certain. In view of these facts, we focus here only on cases where there existed bare majorities (i.e., 3–2 or 2–1).

RESULTS

We test the null hypothesis that the probability that a group will adopt the majority position in a case involving the critical (sexual) alternative is independent of whether the majority is in favor of or opposed to the critical alternative. The relevant data are presented in Table 1. The test of significance is due to Cochran (1), and permits the rejection of the null hypothesis at the .01 level. The treatment of the critical alternative by groups is significantly more negative than the initial treatment by individuals.

Similarly, individual private judgments made after the interaction tended to rank the critical alternative lower than did pre-interaction individual judgments as is indicated in Table 2. The null hypothesis that the direction of individual shifts in ranks assigned to the critical alternative is equally likely to be positive or negative can be rejected at the .05 level by the sign test. Thus, private reactions of individuals to the critical alternative are significantly more negative after the interaction than they are initially.

DISCUSSION

The rejection of the hypothesis of independence leaves a number of alternative explanations. In particular, we need to examine some alternatives to the

assumption that there is something about the critical alternative that leads to the observed behavior. These hinge upon the question of whether the observations violate the independence requirements of the test model. Since the unit of observation in Table 1 is the paired comparison rather than the group, results from a single group may enter into that analysis as many as four times and as few as none. The procedure of sampling is analogous to sampling with replacement (in which, of course, a particular item may enter into a sample as many times as the sample size or as few as none). The relevant question is not whether such an event could occur but whether it is a tenable hypothesis that the occurrence of such an event affected the results. In formal sampling with replacement, the question is whether a single item or subset of items, drawn repeatedly, substantially biases the estimates. In the present case we ask whether the results are substantially dependent on a particular group or small subset of groups. Inspection of the data indicates that such is not the case.

The evidence suggests that some feature of the critical alternative affects decision-making within the groups. The fact that, in a non-objective decision-problem, it is possible to distinguish an alternative that is relatively difficult to defend in a group situation suggests two possible mechanisms of social influence. One derives from the public character of decision-making in a group situation as contrasted with the private individual judgments and the well-established pressures that lead to a public distortion of private opinion when it is socially unacceptable. Although such a mechanism is undoubtedly present here and will explain part of the results, we do not believe it explains the data completely for two reasons. First, the subjects knew at the time they made their pre-interaction judgments that they would have to defend their opinions in the group. Consequently, it is reasonable to expect them to tend to record their "public" opinions at the outset. Second, in the post-interaction judgments the pressure toward social conformity implicit in a group discussion was no longer overt and, under the public-private hypothesis, we should expect a tendency to revert to private opinions. Admittedly, there are alternative explanations for these phenomena. All we allege is that the interpretation below is reasonable.

We believe that a major influence mechanism involved in this case is the evocation of a criterion of evaluation (illegitimate sexuality) that is not consciously considered by many subjects prior to the group interaction, but which, when called to their attention, is recognized as decisive by them. Such an interpretation is consistent with the results indicated above and with our impressions of the way in which the groups tended to reach decisions with respect to the critical alternative. In observing the group interactions, one is struck by the extent to which reference in the discussion to the overt sexuality of the critical alternative appears to bring about recognition of the illegitimacy of the

unconscious motivations underlying the attribution of "beauty" to that alternative and consequently a shift of opinion.

Such a shift appears to stem from a form of influence that is different from simple social pressure. In the latter case, shifts are conceived primarily as adjustments to interpersonal disequilibria within the group. In the present case, we observe behavior similar to that of subjects considering objective problems. Shifts in opinion appear to reflect a movement toward greater internal consistency between the specific decision of an individual and his conscious value system. This movement toward consistency is facilitated by the exchange of suggestions, criteria, etc. in the group, since such activities serve to extend the framework within which alternatives are evaluated. Thus, group discussion results in an increase in intra-personal consistency and, in the case of widely shared norms, an increase in the social "correctness" of decisions.

SUMMARY

In a study of group decision-making, support was found for the prediction that pre-interaction individual judgments would be less consistent with widely shared norms than would be either group decisions or post-interaction judgments by the same individuals. In a task involving ratings of female "beauty" from photographs, the probability that a group operating under a unanimity rule would adopt the pre-interaction judgments of a majority of its members depended on whether that majority was in favor of a critical alternative identified independently as exhibiting significantly greater manifest sexuality than the other protographs considered. In addition, individual post-interaction judgments exhibited the same tendency, down-grading the critical alternative. These results are interpreted in terms of an extension of Thorndike's observations on group problem-solving in an objective situation. In general, it is argued that the evocation of alternatives and socially-defined criteria for evaluation represent important modes of interpersonal influence, the net effect of which is systematically to bias group decisions and post-discussion individual decisions in the direction of conformity to accepted standards of correctness, where such standards exist.

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REFERENCES

1. Cochran, W. G., "Some Methods for Strengthening the Common Chi-square Tests," *Biometrics*, 1954, 10, 417–451.
2. Kendall, M. G., *Rank Correlation Methods*, New York: Hafner, 1955.
3. Shaw, M. E., "Comparison of Individuals and Small Groups in the Rational Solution of Complex Problems," *American Journal of Psychology*, 1932, 44, 491–504.
4. Thorndike, R. L., "The Effect of Discussion upon the Correctness of Group Decisions when the Factor of Majority Influence Is Allowed For," *Journal of Social Psychology*, 1938, 9, 343–362.
5. Timmons, W. M., "Can the Product Superiority of Discussions Be Attributed to Averaging or Majority Influences?" *Journal of Social Psychology*, 1942, 15, 23–32.

Reciprocal Influence of the Group and Three Types of Leaders in an Unstructured Situation *

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In the impressive concentration of experimental effort upon the problem of leadership in the small group during the past few years, most of the attention seems to have been devoted to the power or influence of the leader over the other group members. It has been recognized, at least at the verbal level, that leadership is not independent of the total group membership. Nonetheless, too many research and practical attempts at group and community change have proceeded as if it were independent, as if, by changing his commitment, a leader would in turn effect a corresponding change in the beliefs, or at least overt behavior, of the entire membership. This modified version of the one-sided, great-man theory of leadership would probably possess high validity in a situation where the "leader" held absolute power, as in certain dictatorships. But it hardly can be expected to be equally fruitful in the less closed, informal group where the maintenance of the leadership position is contingent in varying degrees upon the good graces of the members.

The primary focus of this study was on the influence of the group upon its leader under varying conditions. Also of concern was the reciprocal influence of the leader on the group, as well as the relationship of certain personality characteristics, satisfaction and solidarity of the group, informal status and popularity to the leaders' and members' change or lack of change of group-centered evaluations.

Three types of small group leaders, sociometrically determined, were investigated: formal, informal and formal-informal. The small groups whose leaders were studied were squads in an Army airborne division. The *formal* leader was the actual squad leader; as designated in this study, he held his position by Army appointment only and was *not* the choice of the other squad members as their leader. The *informal* leader was the man in the squad whom the other members would have preferred as squad leader; he was not in this case the

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official squad leader. The *formal-informal* leader was at the same time the actual squad leader and the one preferred by the men to be their squad leader.

The influence situation was, of necessity, an unstructured one in which an intact squad was free to interact. The general procedure consisted of presenting the squad with an ambiguous situation where, after some degree of standardization of the members' judgments of a common stimulus, the leader was exposed to a stimulus which, without his or the other members' knowledge, was made to diverge in marked degree from the stimulus which continued to be presented to the other members of the squad. This procedure was followed so that the usual employment of a collaborative stooge could be eliminated, thus leaving the entire group free to interact and to impose group pressures in their characteristic form and method.

An important determinant of the effects of discrepant source evaluations is the divergence of those evaluations from the opinion of the recipient, whether they be made in small, step by step gradations or in larger, more unvarying amounts (2). This should be equally applicable to the attempts at influencing a single person or a group toward some desired end. This consideration led to two variations in the way the leader was exposed to discrepant stimuli. In the *gradual* approach the stimulus was increased to its maximum in three steps. In the *absolute* variation the stimulus of the leader was made to reach its maximum difference from that of the other members in one step, by an amount equal to the maximum stimulus difference in the gradual condition. The total number of stimulus exposures was the same for the two conditions. In the gradual condition the total trials were divided equally among the three steps of increase, while in the absolute condition the maximally increased stimulus was presented for all the trials.

The design of the study provided six main experimental conditions: formal, informal and formal-informal leaders, under the gradual and the absolute approaches of introducing the discrepant stimulus to the leader.

METHOD

Subjects

A total of 354 men served as Ss. This number was comprised of 285 experimental Ss in 51 squads and 69 control Ss in three control groups. The experimental Ss consisted of 51 leaders, one from each squad (subsequently called *leader*), and 234 other squad members (subsequently labeled *members*).

Nine of the 51 squads served in each of five of the six experimental conditions, with only six squads participating in the sixth, informal-absolute, condition. The modal number of men in each squad, including the leader, was six, this small a number resulting from daily military duties which the

squads under study had to perform. All the Ss, experimental and control, served in the experiment in the squads of which they were regular members.

Two of the three control groups were for comparison of the behavior of the leaders under the gradual and absolute conditions (control N's = 19 and 21, respectively). The third control (N = 29) was a comparison group for the responses of the members.

Apparatus and Test Materials

Apparatus: For a situation free of pre-established group and individual evaluations, an unstructured stimulus was necessary, and the experimental variations required a stimulus which would permit precise manipulation.

The judgment of controlled distances between two flashes of light in a totally dark room was selected as the task that seemed to satisfy these requirements. The flashes of light were activations of 1/25th watt neon bulbs controlled by circuits in four Hunter Decade Interval Timers. The time interval between the two flashes of light was .5 second, the duration of each flash .2 second, and the time interval between trials was 30 seconds.

Two different sets of stimuli were employed for each squad. One of these was presented only to the leader and the other only to the members. In the first, the norm or concept formation session, both the leader and members were presented two flashes of light 24 inches apart. In the second, the influence session, the members continued to be presented the same stimulus while the distance between the two flashes of light presented the leader was made to increase 36 inches—by three steps of 6, 15 and 36 inches in the gradual approach, and by one step of 36 inches in the absolute approach.

The stimulus lights of the leader and the members were separated by a six-foot high partition which extended from the front of the room, where the lights were secured, toward the back of the room to within two feet of where the subjects were seated. The leader sat on one side of the partition and the members on the other. Separated in this way, the leader and the members were seeing different stimuli. To prevent an S's bumping into the partition and becoming suspicious, a safety rope was extended across the appropriate area between the Ss' chairs and the end of the partition.

The experiment was carried out in two similarly equipped rooms, which permitted the simultaneous collection of data from two squads, one in each room. The stimulus lights in both rooms were activated by common circuits which were controlled by a single panel located in a third room. By means of a four-positioned switch, one E determined the appearance of the particular stimulus lights, which was always the same in both rooms. A separate E sat in each room with the Ss where he gave them instructions and recorded their judgments. The E sat behind the Ss in an enclosure where, with the aid of

infra-red light shielded from their view, he could read aloud the pre-established random order in which the judgments were to be given.

Sociometric questionnaire: Informal status in the squad was determined by a sociometric questionnaire which included items aimed at measuring both leadership and popularity. Only the scores on the leadership criteria (preferences for squad leader, squad representative to discuss squad problems with company commander, and leader of night patrol into enemy territory) were considered in determining the informal status, although measures derived from the popularity criteria were used in other parts of the study.

Unit satisfaction questionnaire: The unit of concern in this study was the squad. From a more comprehensive questionnaire constructed to measure morale and satisfaction at several military levels, questions relating specifically to the squad were considered for purposes of this study. Included were items having to do with confidence in one's squad for combat effectiveness, degree of friendship among members of one's squad, degree of supportiveness and encouragement displayed by one's squad leader, and the job efficiency of one's squad leader.

Personality measures: These included the older California F-scale (1) and the newer scale of authoritarianism of Webster, Sanford and Freedman (3).

Procedure

Experimental groups: The experiment was carried out in two sessions without any break between them. The aim of the first session was the standardization, at least to some extent, of the evaluations of the leader and members of a common stimulus situation. The purpose of the second session was to determine the reciprocal influence of the leader and members upon each other's judgments under conditions where the stimulus to which the leader was exposed was made to differ to a marked degree from that being faced simultaneously by the members.

At the beginning of the first session the Ss were guided through a darkened space into the completely dark experimental room. Members were seated on one side of the partition separating the leader's and members' stimulus lights and the leader was seated on the other side. While getting dark adapted, Ss were instructed that the purpose of the experiment was to determine the accuracy of the group in making judgments in an unclear situation. Although this was not suggested by E, the Ss seemed to have interpreted the task as one relating to night fighting, one in which all could be assumed to be ego-involved.

During the first session both the leader and members were exposed for 30 trials to the two flashes of light that were 24 inches apart. In the second session the members continued to be presented this same stimulus for 30 more trials while the leader was being exposed for an equal number of trials to the flashes

of light that were further apart by either 6, 15 or 36 inches. In the *gradual* approach, the leader was introduced to the 6, 15 and 36 inch stimulus increases in that order, with ten judgments being rendered for each stimulus. In the absolute approach, the leader was presented the stimulus of the largest, 36 inch increase, for all 30 trials. Thus, with the most extreme stimulus, the leader was viewing two flashes of light that were actually 60 inches apart while the members at the same time were seeing the stimulus lights that were only 24 inches apart.

In both sessions Ss called aloud their judgments as their previously assigned number was called out by E. The order of judgments was randomized, within the total 30 for the first session and in blocks of ten in the second session.

The individuals were left free in both sessions to joke and make fun of any member's judgment, a practice followed almost invariably when deviant judgments were made. It was assumed that the method in which this was done would reflect the techniques of group pressure usually employed in a given group.

Control groups: The purpose of the control groups was to determine the judgments of the stimuli under conditions of minimal social pressure. Therefore these subjects, without any discussion, made their estimates privately during both sessions and recorded them themselves in a small booklet.

As in the experimental groups, all control Ss were presented the stimulus lights that were 24 inches apart for the first session, i.e., for the first 30 trials. Subjects in the member control group continued to be exposed to the same stimulus throughout the influence session. On the other hand, individuals in the leader-absolute control group were presented the lights of maximum, 60 inch, distance throughout the second session. And persons in the leader-gradual control group, during the influence situation, were exposed to the stimulus increases in 6, 15, and 36 inch amounts, with ten judgments of each stimulus.

Expediency prevented the use of only leaders for the leader control group. While it might have been ideal to match the experimental and control groups according to status, this was not possible in this study. The possibility that this impairs the validity of the results is minimized by the fact that no specific reason exists for expecting leaders in the non-influence situation to judge the stimulus any differently from other members.

After the experiment, all Ss, experimental and control, were led from the experimental room by E under extreme caution that no S should see the inside of the experimental rooms or for any reason suspect the existence of the partition between leaders' and members' stimuli. No information was ever given to the Ss concerning the real purpose of the study, nor were any hints given by E concerning the distance between any of the lights.

The sociometric questionnaires had been administered to the Ss in the recrea-

tion rooms of their own barracks a week prior to their participation in the experiment. The questionnaire on unit satisfaction and the personality scales were administered during the time the squads were reporting for the experiment. The usual procedure was for four squads (one platoon) to report at a given time. While two squads were serving as Ss in the experiment, the other two were being given the personality scales and questionnaire. This meant that approximately half of the Ss completed these scales before and the other half after the main experiment.

RESULTS

The effects of the experimental treatments were determined by computing a change or difference score for each individual, experimental and control. This score was determined by subtracting the mean of the individual's 30 judgments in the first session from the mean of each block of ten of his judgments in the second session. Analysis of the results by blocks was necessary to compare the effects of the gradual and absolute approaches; at the same time this analysis permits the control of a larger portion of intra-subject variability.

Effect of the Groups on the Leaders

The mean increase in judgments of the three types of leaders and control Ss following introduction of the discrepant stimulus in the gradual and absolute discrepancy conditions are presented in Table 1 in blocks of ten judgments. The results from which these summary figures were derived were treated by analyses of variance, a separate analysis for the gradual and absolute approaches because of the differences in the between blocks treatments.

The F-ratios in Table 2 show the leaders in both the gradual and absolute conditions to have differed significantly in the extent to which they were influenced by the judgments of the other group members. The effects of trial blocks were significant only in the gradual approach, an indication simply that

TABLE 1

Mean Increase Per Block of 10 Judgments of Leaders and Control Group Following Introduction of Discrepant Stimulus

	Gradual			Absolute		
Discrepancy	Block 1 6″	Block 2 15″	Block 3 36″	Block 1 36″	Block 2 36″	Block 3 36″
Control	12.96	20.57	34.55	34.57	35.63	38.60
Formal	5.50	13.35	21.26	13.48	14.65	15.19
Informal	3.18	6.60	12.68	21.51	18.00	18.90
Formal-informal	3.47	8.43	15.55	31.42	30.39	25.42

TABLE 2

F-ratios for Experimental Effects

Source	Gradual		Absolute	
	F	P*	F	P†
Leaders	4.12	<.05	5.29	<.05
Trial blocks	3.73	<.05	1.75	>.10
L x TB	.11	..	.42	..

* 2.24 df.
† 2.21 df.

the larger discrepancies were reported by the leaders as being larger. That this latter variable was negligible in the absolute approach (Table 1) shows that in this condition the smaller judgments of the group members exercised a constant effect of restraint on the leaders' judgments of the discrepant stimulus. This constant effect, which also resulted in negligible interaction of leaders with trial blocks, began at the very outset of exposure of the leader to the discrepant stimulus, a fact not presented in the above tables but observed from the untreated data.

In Table 3 is presented a comparison of the relative increases in the judgments of the leaders and control Ss accompanying the most extreme stimulus, that of the 36-inch discrepancy during the last ten trials, the only phase in which the stimulus discrepancy was common to the gradual and absolute approaches. The appropriateness of the last ten judgments as the basis of comparison is furthered by the lack of difference between blocks of trials in the absolute approach.

Perfect accuracy in judgments of control members would have resulted in

TABLE 3

Comparison in Mean Changes in Judgments of Control Group and Leaders for Last Block of 10 Judgments

	Gradual				Absolute			
	N	Mean Change	Diff Control	t	N	Mean Change	Diff Control	t
Control	19	34.55	....	....	21	38.60	....	....
Formal	9	21.26	−13.29	2.38*	9	15.19	−23.41	3.41†
Informal	9	12.68	−21.87	4.82†	6	18.90	−19.70	2.32*
Formal-informal	9	15.55	−19.00	2.33*	9	25.42	−13.18	1.63‡

* $P < .05$.
† $P < .01$.
‡ $P > .10$.

the stimulus increase being judged as 36 inches. The leaders' judgments too would have increased by the same amounts, if they had been completely accurate and not influenced by the evaluations of the other members. It is apparent, however, that, while control Ss closely approached the veridical in their judgments, the leaders did not; that, in fact, the latter were significantly constrained in their evaluations by the smaller judgments of the members in all of the six conditions except the formal-informal-absolute. The leader most influenced was the formal leader in the absolute approach, and the one least influenced was the formal-informal leader in the same approach. The leader in the formal-absolute condition was significantly more influenced, in comparison to the control group, than the leader in any other single condition ($P<.01$). The formal-informal leader in the absolute approach, on the other hand, was significantly less influenced ($P<.05$) than the leader in any other condition except the formal-gradual. The behavior of the formal leader in the gradual and absolute approaches reflects a striking difference in the referents of his judgments as the ambiguity of the situation varied. In the more structured situation, the gradual condition in which stimulus variations at any one stage were minimal, the formal leader, the leader who held his position by military designation only and not by group endorsement, relied more on the situation and less on the other group members in making his evaluations. This tendency was reversed, however, in the more ambiguous absolute condition, with the unpopular leader in this situation displaying a marked tendency to accept the judgments of the other members of the group as standards for his own judgments.

In addition to separate analyses of variance for the gradual and absolute approaches, the results were analyzed so that the effects of these approaches on leaders' judgment could be compared. This meant omitting the results in the first two blocks of ten judgments and analyzing the effects in a three by two factorial design for the last block of ten judgments, the only block for which the 36-inch discrepancy was common to both approaches. This analysis yielded no significant difference between the effects of the two approaches.

Influence of Leaders on the Groups

This effect can be determined satisfactorily only by an experimental treatment in which the evaluations of the different leaders are at controlled and equivalent distances from the judgments of the members. This condition was not satisfied in this study because, as shown by the preceding results, leaders varied in the extent to which they deviated in their judgments from the judgments of the other members.

In an attempt to reduce this shortcoming, changes in member judgments were analyzed in terms of proportion of change rather than on the basis of

TABLE 4

Comparison in Mean Changes in the Judgments of Control Group and Members in the Last Block of 10 Judgments

	Gradual				Absolute			
	N	Mean Change	Diff Control	t*	N	Mean Change	Diff Control	t
Control	29	.74	....	....	29†	.74	....	....
Formal	38	2.56	1.82	.745	47	2.59	1.85	.758
Informal	50	.66	—.08	.030	23	2.41	1.67	.662
Formal-informal	36	1.62	.88	.333	40	4.58	3.84	1.264

* No t is significant.

† The same member control group was used for the two approaches since in this control variation members judged in the second session for 30 trials the same stimulus they had judged in the first session.

absolute magnitudes of change. This proportion was computed by dividing the mean change in a member's judgments in one of the three blocks of ten judgments by the mean difference between his and the leader's judgments at the beginning of that block of judgments. Thus, the mean change of a member in block 3 was divided by the mean difference between his and the leader's judgments in block 2; mean change in block 2 was divided by the mean difference between leader and member judgments in block 1; and the change in block 1 was divided by mean differences between the total 30 judgments of leader and member in session 1.

These proportions were analyzed in three analyses of variance: the gradual and absolute approaches separately across blocks, and the gradual and absolute approaches under one factorial design with the first two blocks omitted.

No significant differences were found between any conditions in the effects of the different leaders on judgments of the members.

The reason for no between-conditions difference in the influence of the leader on member judgments can be deduced from Table 4 which presents the mean magnitudes, not proportions, of changes in judgments of members and control subjects in the last block of ten judgments, the block in which the stimulus common to both gradual and absolute conditions was judged. The different leaders in all the conditions are seen to have had almost no effect on the judgments of the members, as is shown by the close similarity of change in control and member judgments.

Other Correlates of Concept Change

Authoritarianism, satisfaction with the squad and informal status (measured as described on page 60), and group solidarity, represented by the degree of

agreement among judgments of an entire squad during the first session (as measured by the standard deviation of the judgments of each squad), failed to relate to changes in the judgments of either the members or the leaders in the influence conditions. Members' popularity did relate significantly to their influence by the leader in the two informal conditions, informal-absolute and informal-gradual (r's = .54 and .34, respectively). Failure of the other indices to relate to judgmental change is perhaps attributable to the compellingness of the group pressures which operated to mask out the effect of these other factors.

DISCUSSION

Most striking of the results are the differences in influence of the leaders on the groups and the groups on the leaders. In most conditions, the leader conformed quite closely in his own judgments to the group evaluations, despite the objective difference between the situation he and they faced; and, in those conditions where the leader deviated, his influence on the group was almost non-existent. Thus not only did the groups exercise a constraining effect on their leaders' judgments, but the reinforcement derived from the more similar judgments of other members was of sufficient strength to override the effect of the less similar judgments of the leaders.

Special attention is called to the behavior of the formal leader in the absolute, less structured, situation. The fact that this individual was the most conforming to group evaluations leads one to wonder if any leader, knowing he was not liked, would dare deviate too far from the group under fear that he would be disliked even more. If this is so and the present results are reliable, one implication for the military is that when facing a very ambiguous situation, one devoid of formally decreed guides of behavior as might occur in combat, the unpopular squad leader might actually "follow" his men more than "lead" them because of his greater need for their approval and consequent dependency upon their evaluations. Perhaps the more effective leader would be the one who held his position not only by formal decree but also by informal choice of the other members. It appears from the present results that a leader of the latter type would at least exercise a greater independence of judgment in the more ambiguous situation.

SUMMARY

This study was concerned with the reciprocal influences of the leader of a small group on other members of the group and their influence on him, with primary focus on the latter aspect.

Each group was placed in an unstructured situation, where, after some de-

gree of standardization of members' evaluations, the leader, without the subjects' knowledge, was presented a stimulus that differed markedly from the one that continued to be presented to the other members.

Two flashes of light in a dark room provided the stimulus. In the norm or concept formation session all members, including the leader, judged for 30 trials the distance between light flashes that were a constant 24 inches apart. In the influence session the members continued to judge the same stimulus for 30 more trials, while for an equal number of times the leader was presented flashes of light that were increased in distance up to 36 inches. In one variation, the *gradual,* the leader's stimulus was made to increase in three steps of 6, 15 and 36 inches with ten judgments under each increase. In a second variation, the *absolute,* the leader's stimulus for all 30 trials of the influence session was 36 inches larger than the stimulus being presented to the other members. All judgments were made aloud to facilitate verbal interaction and group pressures.

The small groups studied were squads from an Army airborne division. From these, three different types of leaders were sociometrically determined. The *formal* leader was the official squad leader but was not preferred as leader by the men. The *informal* leader was preferred by the men to be the squad leader but was not the official leader. The *formal-informal* leader was at the same time the official squad leader and preferred by the men.

Six experimental conditions were thus provided: formal, informal and formal-informal leaders under the gradual and absolute approaches. Nine squads served in five of the six conditions, with only six squads in the informal-absolute condition.

The total number of *Ss* was 354, 285 experimental and 69 control.

In comparison to the control groups, the leaders in all conditions conformed markedly to the judgments of the members despite the large differences in the leaders' and members' stimuli. Even in those conditions where leaders did depart from group judgments in their own evaluations, the influence on the group was almost nil.

Significant differences occurred among the different leaders in the extent to which they were influenced by group judgments. Most conforming to the evaluations of other members of the group was the unpopular formal leader in the absolute, or more uncertain, condition. Possible implications of this for military leadership were indicated.

Authoritarianism, group satisfaction and solidarity, and informal status in the group did not relate to proneness to influence. The presumed reason for this was that the compellingness of group pressures minimized the operation of these factors. However, members' popularity in the squad did correlate significantly to their influence by the leader in the informal-absolute and informal-

gradual conditions, the conditions in which the leader was the one preferred by the men to be their leader.

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REFERENCES

1. Adorno, T., E. Frenkel-Brunswick, D. Levinson, and R. N. Sanford, *The Authoritarian Personality*, New York: Harper, 1950.
2. Harvey, O. J. and J. Rutherford, "Gradual and Absolute Approaches to Attitude Change," *Sociometry*, 1958, 21, 61–68.
3. Webster, H., N. Sanford and M. Freedman, "A New Instrument for Studying Authoritarinism in Personality," *Journal of Psychology*, 1955, 40, 73–84.

The Effect of Acquiescence Response-Set upon the Relationship of the F Scale and Conformity

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The demonstration of acquiescence variance in the usual form of the F scale measure of authoritarian personality trends (e.g., 3) leaves social psychology with the task of re-examining the well established correlates of the F scale to determine the extent to which these are a function of the direction of item wording or of item content. Such re-examination has recently been reported for the correlations of F with ethnocentrism and intelligence, with the result of reducing, but not eliminating, the assumed degree of correlation of attitudinal content in both cases (4).

This paper reports a minor study re-evaluating the well established (2, 6, 7) correlation between the F scale and suggestibility or conformity to the expressed judgments of others. It has already been proposed that this correlation might primarily be a function of a generalized tendency to agree with questionnaire items regardless of item content (2, p. 102).

The conformity measure. Subjects were asked to judge the number of beans enclosed in plastic bags attached to a cardboard and a sheet upon which they could record their judgments. At the time of judging one bag, no others were in view. The record sheet below each bag allowed room for as many as twenty judgments to be recorded. For those in the conformity situation, six estimates were already recorded in a variety of handwritings and pencil and ink types. Among the ten bags judged, there were two each with true values of 300, 400, 500, 600, and 700. The recorded judgments were designed to distort estimates upward for one of each of these pairs and to distort estimates downward for another of each of the pairs. The amount of distortion in the average of the recorded judgments was approximately 15 per cent either up or down. The bags were presented in a mixed order. If, in a comparison of the subject's two judgments for identical bags, the direction of the difference of the judgments was in the conformity direction, he was given the score of +1. If there was no difference, 0; if there was a difference running against the conformity pressure, he was given a score of —1. To establish that conformity was taking place, the scores of 50 persons subjected to the conformity pressures were compared with the scores of 20 persons who went through the identical task with record sheets containing no "previous" estimates. The means of the two groups were 3.1 (out of a possible maximum of 5.0) and —.5. The t-ratio of the difference between them is 5.82, providing a p value well beyond .0001. The Kuder-Richardson reliability of the conformity score for the 50 persons

subjected to conformity pressure was only .39, due no doubt to the small number of items. Had the test been four times as long, as was Crutchfield's (6), the estimated reliability would have been .72, which still compares unfavorably with Crutchfield's .90.

The attitude scores. The introductory class from which the *Ss* were volunteers had taken a 60-item version of the F scale containing the 30 original items and Christie's (5) 30 reversals, mixed so that both original and reversed items were in the first half of the test as well as on the last half of the test, and so that the last 30 items contained the opposite forms of the first 30 items. For this analysis all items have been employed without regard to whether they came in the first half or the second half of the questionnaire.

Results. The F score based upon the original 30 items correlated .17 with the conformity score, a value which is significant only at the .13 level by one-tail test. Thus, while the trend is in the expected direction, we have not achieved a clearcut confirmation of the several-times replicated result, in which correlations of .39 (6) and .48 (7) are typical. This is no doubt due to the low reliability of the conformity measure. The correlation between the reversed F scale and conformity (so scored that high scores represent more authoritarian attitudes) surprisingly enough turned out to be higher, .26, significant at the $p<.04$ level by a one-tail test. The correlation between the total of the original and reversed F scale scores and conformity is .27, significant at the $p<.03$ level. The correlation between conformity and a total representing pure acquiescence (that is, the tendency to endorse any item no matter in which direction it was worded) is .04. The correlation between the original and the reversed F is .31, higher than the values usually reported, probably because of the greater number of items involved and the repetition of much specific item content between the original and reversed members of each item pair.

Insofar as these data are indicative, they reassure us that the correlation between conformity and the F scale is a function of F-type item content. The problem is of sufficient importance, however, that it should be subject to further scrutiny.

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REFERENCES

1. Adorno, T. W., E. Frenkel-Brunswik, D. J. Levinson, and R. N. Sanford, *The Authoritarian Personality*, New York: Harper, 1950.

2. Beloff, H. "Two Forms of Social Conformity: Acquiescence and Conventionality," *Journal of Abnormal and Social Psychology*, 1958, 56, 99–104.
3. Chapman, L. J., and R. D. Bock, "Components of Variance Due to Acquiescence and Content in the F Scale Measure of Authoritarianism," *Psychological Bulletin*, 1958, 55, 328–333.
4. Chapman, L. J., and D. T. Campbell. "The Effect of Acquiescence Response-Set upon Relationships among the F Scale, Ethnocentrism, and Intelligence," *Sociometry*, 1959, 22, 153–161.
5. Christie, R., J. Havel, and B. Seidenberg, "Is the F Scale Irreversible?" *Journal of Abnormal and Social Psychology*, 1958, 56, 143–159.
6. Crutchfield, R. S., "Conformity and Character," *American Psychologist*, 1955, 10, 191–198.
7. Nadler, E. B., "Yielding, Authoritarianism, and Authoritarian Ideology Regarding Groups," *Journal of Abnormal and Social Psychology*, 1959, 58, 408–410.

Reference Group Theory, Bureaucratic Career, and Neighborhood Primary Group Cohesion [1]

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The present paper seeks to supplement previous formulations of reference group theory, by explicitly introducing the concept of "ordered change" as well as all three periods of time (past, present, and future). The justification for this theoretical elaboration is that it resolves prior contradictory findings and aids in the understanding of otherwise paradoxical data.

Traditional formulations of reference group theory frequently imply that a great deal of mobility between primary groups is not consistent with cohesion in these groups. However, it will be shown that, where "ordered change" and three time periods are conceptually taken into account, high membership turnover is consistent with primary group cohesion. As a consequence, results of studies where change leads to anomie and those where it does not can both be accounted for in terms of this elaborated reference group theory.

ORDERED CHANGE—THE CAREER

This point may be clarified by exploring what is meant by "ordered change." Change is ordered where integration into one group is considered to be a prerequisite for integration into a second group. The concept of ordered change is perhaps most clearly illustrated in the educational field where grade school is a prerequisite for high school, high school a prerequisite for college, and college a prerequisite for professional school. It is not only that each stage is required for the following one but that training in each group is necessary for movement into the next.

In this connection it should be pointed out that the advent of industrial bureaucracy has served to make ordered change (as characterized by the "career") a major factor in contemporary society.[2] The occupational career is by definition composed of a more or less orderly and predictable set of stages in which each stage is a prerequisite for what follows.

If change is ordered around a career, it is possible for the individual to view both his current membership group and his future membership group as refer-

[1] The author wishes to thank Glenn H. Beyer, director of the Cornell Housing Research Center for permitting use of the data and Peter Blau, William Evan, and Herbert Menzel for helpful comments. However, the views expressed in this paper do not necessarily reflect theirs.

[2] Analysis of the occupational structure of American society would seem to indicate that occupations are indeed becoming more professional (7, p. 372).

ence groups, without endangering his integration into his current group and without preventing his joining a different future group. In contrast, there may very well be a contradiction between both his past membership group and his current membership group being viewed as reference groups. In the first case adherence to both groups is necessary for the orderly development of the career, while in the second case adherence to both groups no longer serves career purpose. Put somewhat differently, high membership turnover in primary groups will be consistent with primary group cohesion where the individual has a stepping-stone reference orientation and where the change is an ordered one. To illustrate the implications of ordered changes along a time dimension, two groups of studies will be reviewed—one which implicitly makes the assumption of unordered change, and one which makes the assumption of ordered change.

UNORDERED CHANGE—HIGH MEMBERSHIP TURNOVER AND PRIMARY GROUP ANOMIE

There have been several studies which explicitly or implicitly utilize a reference group point of view and also assume unordered change. Merton and Kitt, in their analysis of reference group theory, suggest that the soldier who is put in the anomic replacement depot loses all sense of identification with prior groups and, as a consequence, is only too willing to join any new group to which he is assigned. In contrast, an individual who moves from one group directly to another is unlikely to integrate into the new group. His sense of identity and loyalty to the old group will inhibit him from integrating into the new group (12, pp. 96–99).

Hoselitz has used the same logic in describing the process of urbanization and industrialization among the African tribes (9, pp. 552–554). He argues that urban transitional areas with their institutional anomie succeed in divorcing the native from his tribe. This in turn makes the native more susceptible to integration into truly urban groups and speeds up the process of industrialization and urbanization. Without such transitional areas and without such anomie, the native would cling to his tribal ways in the urban environment and slow up industrialization.

Newcomb, in his discussion of Bennington College, pointed out that frequently those least able to integrate into the college were those most closely tied to their family. This was especially important in that these two groups had antithetical views on many subjects (13, pp. 144–47). Curle and Trist, in their work on English war prisoners, show the extreme difficulties former prisoners suffer when moved directly from their prison camps to civilian life. The authors indicate the need of having, in this case, an institutional "decompression chamber" to re-orient the former prisoners to civilian life (3, 4).

Implicit in all of these studies are at least two things. First, the original group is not a prerequisite, nor does it train the individual for movement into the second group. Quite the contrary, the assumption is made that relations between the two groups are either *ad hoc* (army situation) or antithetical to each other (tribal to urban change). The second assumption which is both implicitly and explicitly made is that individuals who commit themselves to one group (utilize it as a reference group) will find it difficult to integrate into another group. In other words, primary group cohesion (with its implication of reference group orientation) is incompatible with high rates of mobility between groups.

ORDERED CHANGE—HIGH MEMBERSHIP TURNOVER AND PRIMARY GROUP COHESION

In contrast to the above studies, there are several which point out the existence of both high membership turnover and primary group cohesion. For instance, W. H. Whyte points out that in Park Forest, a Chicago suburb populated by junior executives, there is approximately a 33 per cent turnover each year (15, p. 303). This turnover is almost as high as the "South End" of Boston, which Firey refers to as a transitional area with great anomie (6, p. 305). However, Whyte maintains that Park Forest has a tremendous neighborhood cohesion. Festinger also suggested great cohesion in a community of married students at the Massachusetts Institute of Technology, despite the guaranteed one hundred per cent turnover every three or four years (5, pp. 158 ff.). Rossi has shown that local neighborhood friendships are primarily affected by occupational position, not by neighborhood transiency (14, pp. 36–37). What characterizes all of these groups which develop high neighborhood cohesion, despite high membership turnover, is that they consist of people whose jobs are organized around careers. This point is most clearly made in the Whyte study, where he explicitly states that each neighborhood group is viewed as a training ground for moves to future neighborhoods, and that neighborhood moves parallel career moves.

In short, these latter groups of studies would seem to provide evidence that, where ordered change occurred, both high membership turnover and primary group cohesion are possible.[3] This point and its implications for reference group theory may be systematically illustrated by a study which suggests how integration into the present neighborhood relates to past, present, and future reference groups.

[3] Merton and Kitt (12, pp. 67–91), in their discussion of "anticipatory socialization," indicate one mechanism by which individuals are able to integrate rapidly into a new group. However, since the authors assume unordered change, their analysis frequently leads them to conclude that simultaneous integration into present and future groups is not possible.

The respondents are persons living in the Buffalo area who had recently moved into new homes when the study was done between June and October, 1952. Only individuals with children under 19 were interviewed. For purposes of the study some of them were interviewed in block clusters, others were interviewed in random area samples, while still others were interviewed on a stratified income basis.[4]

INTEGRATION INTO THE PRESENT NEIGHBORHOOD GROUPS AS A FUNCTION OF COMMITMENT TO PAST GROUPS

Following the historical development of respondents' reference group orientation, attention will first be focussed on their past reference group. Respondents were asked, regarding their previous residence, the question, "Were you near houses of good friends?" An affirmative response implies that past neighborhoods are positive reference groups while a negative response implies that they are not. Since reference group by definition means a group with which the individual identifies and which he uses as a standard for his own behavior, it is quite clear why most friendship groups are also reference groups. It should be clear that the reverse statement is not necessarily true, i.e., most reference groups are friendship groups. The view that most friendship groups are reference groups is documented empirically by studies of friendship which indicate that value homophily characterizes friendship relations—friends share common standards.[5]

[4] For a detailed description of the sample, see (1) pp. 38–40, or (11) 59–61.

[5] One of the chief weaknesses of the present index is the assumption made that past friends are still living in the past neighborhoods. Insofar as this assumption is incorrect, there will be a tendency for the hypothesis advanced in this study to be rejected, when in fact it is true. This will especially be the case where the past friends move to the same neighborhood as the respondent. On the other hand, it could be argued that the physical presence of friends in the past neighborhood is not central for identification. In its most extreme form, this argument would be illustrated by those who continue to grieve for dead spouses, relatives, or friends. If the above psychological assumption can be made, then the index can be accepted as is.

There is still another danger in the use of this index in that it is based on the response to a single question. Friendship may have different meanings for various segments of the population. Since I cannot think of any systematic bias which would lead to the results presented in this paper, the assumption is made that the error is random and, as such, likely to lead to a blurring of any positive results. In this connection, it might be pointed out that newcomers to a neighborhood are most likely, when speaking about past neighbors, to use the term "friend" to denote both casual acquaintances and close personal friends. The long-term resident, by contrast, is likely, because of the passage of time, to remember only close friends in the past neighborhood. As a consequence, the hypothesis is much more likely to be blurred among the newcomers than the long-term residents. As the reader will note below, this is in effect what happens.

Where neighborhood integration or membership group is defined, the interest shifts to the extensiveness of group contact rather than the warmth of the relationship (shared values). The following question was used to index integration or present neighborhood membership group: "How many neighbors do you know well enough to call on?" A person may have no close friends in the neighborhood but still know many neighbors. On the other hand, people may have close friends nearby but still not be acquainted with many neighbors. In short, it is assumed that the items used to measure the two concepts are not tautologous.[6]

With these definitions in mind it can be seen (Table 1) that those who have a positive orientation toward their last neighborhood reference group are least likely to integrate into their present neighborhood. The differences are in the direction anticipated by both those assuming ordered and those assuming unordered change. Although these differences are slight, their significance may become apparent when other time dimensions are introduced.[7]

INTEGRATION INTO PRESENT NEIGHBORHOOD AS A FUNCTION OF BOTH PAST AND PRESENT REFERENCE GROUP ORIENTATION

From both the point of view of ordered and unordered change, a negative or indifferent orientation to past neighborhoods plus a positive reference orientation to the present neighborhood will maximize integration into the present neighborhood. In an attempt to determine the individual's reference orientation towards the present group, the same question was asked about the

[6] All that is being suggested is that respondents can distinguish between good friends and people they know well enough to call on. It may indeed be true empirically that those who have good friends are likely to have many of them, while those who do not have good friends are unlikely to call on many neighbors. This is an empirical issue which would in no way affect the reasoning of this article—as long as it can be assumed that logically good friendship is not tautological with calling on neighbors. If the reader finds this particular assumption too heroic, then he should just ignore the use of present neighborhood reference group orientation in the analysis which follows. The major point of the article can be made just using past and future reference group orientation. The present time period was included despite the dangers of tautology, because it illustrates most completely the theoretical point at issue—that reference group orientation in all three time periods should be used.

[7] All findings (unless specifically exempted) are significant at the .05 level or beyond, if it is assumed that a simple area sample was used. The sign test was used in all situations where more than eight comparisons were involved. The Wilcoxon matched-pairs, signed-ranks test was used where eight or fewer comparisons were involved. In Table 1, the differences are significant for the long-term residents but not for the newcomers. However, since the sampling procedure does not meet the assumption of the test and it is difficult to know what tests would be adequate for this extremely varied type of sampling, reliance on tests of significance is extremely dubious. As a consequence, the data can only be justified in terms of their theoretical relevance.

TABLE 1

Average Number of Neighbors Called on in Current Neighborhood, by Friendships in Past Neighborhood, by Length of Residence *

	Average Number of Neighbors Known Well Enough to Call On	
	Newcomers	Long Term Residents
Had good friends in last neighborhood	3.83 (172)	5.34 (365)
Had no friends in last neighborhood	3.97 (101)	5.70 (283)

* Newcomers are those who have lived in their present house nine months or less. Since length of residence affects number of neighbors known, a separate analysis is carried on for long and short periods of residence.

present neighborhood as was asked about the past one, "Are you near houses of good friends?"

Table 2 reveals that the individual most likely to integrate into the present neighborhood is the one who is negative or indifferent towards the past group and positively oriented towards his present group. (The cell on top of each column is higher than any other cell in six out of six comparisons.) It can also be seen that the individual least likely to have neighborhood acquaintances is the one who is positively oriented towards his last group and negatively oriented towards his present group.

Since Blau (2) has suggested that occupational mobility may affect friendship formation, this study has attempted to carry out all analysis of friendship behavior within the context of occupational mobility. In order to operationalize mobility categories, all husbands and their fathers were classified according to the census occupational groupings. All individuals who were lower on the scale than their fathers were classified as downwardly mobile, all higher were designated upwardly mobile, and all others were classified as stable. Those

TABLE 2

Average Number of Neighbors Called on in Current Neighborhood, Reference Orientation to Past and Present Neighborhood, * *by Length of Residence*

Past Neighborhood Reference Groups *	Present Neighborhood Reference Groups *	Average Number of Neighbors Called on in Current Neighborhood	
		Newcomers	Long Term Residents
Negative	Positive	4.91 (53)	6.04 (196)
Positive	Positive	3.96 (101)	5.66 (284)
Negative	Negative	2.94 (48)	4.97 (87)
Positive	Negative	2.94 (71)	4.24 (81)

* For specific question wording see text.

whose fathers were farmers were eliminated from the study. For the exact details of this classification see (11), pp. 59–61.

An examination of the top and bottom rows of Table 3 reveals that the same findings emerge at each occupational level (upper-class and manual-class occupations), while an examination of the middle rows reveals that the same results hold for those who are occupationally mobile as well. (In all rows the extreme left-hand cell is larger than any other cell in the row in 24 out of 24 comparisons.) It may therefore be inferred that the individual who has positive feelings toward his present group and negative ones toward his past group is most likely to integrate into his present neighborhood and that the effects of this combination of reference group orientations are not a function of occupational level or mobility.

Yet an examination of Table 3 reveals one small group (those who are both negatively oriented toward the present neighborhood group and newcomers) who do not conform to one part of the previous prediction. Among this group, those who are positively oriented to past neighborhood groups tend to call on more neighbors in their current neighborhood than those who are negatively committed to past groups (three out of four comparisons). This finding goes counter to formulations of previous reference group theory as well as to those suggested in this paper. If future studies indicate that this is not a chance

TABLE 3

Average Number of Neighbors Called on, by Reference Group Orientation to Past and Present Neighborhoods, by Occupational Mobility, and by Length of Residence

	Average Number of Neighbors Called on in Current Neighborhood			
	Negative Orientation towards Past and Positive towards Present Neighborhood Reference Group	Positive Orientation towards Past and Present Neighborhood Reference Group	Negative Orientation towards Past and Present Neighborhood Reference Group	Positive Orientation towards Past and Negative towards Present Neighborhood Reference Group
	Long-Term Residents			
Stationary upper class	6.72 (51)	6.16 (73)	5.21 (23)	3.79 (14)
Upwardly mobile class	6.00 (60)	5.82 (73)	5.41 (32)	3.93 (28)
Downwardly mobile class	5.64 (34)	5.27 (43)	4.00 (10)	4.86 (14)
Stationary manual class	5.53 (50)	5.43 (95)	4.54 (22)	4.43 (25)
	Newcomers			
Stationary upper class	4.83 (18)	4.36 (31)	2.94 (17)	3.90 (19)
Upwardly mobile class	4.70 (44)	3.42 (33)	2.00 (29)	4.47 (23)
Downwardly mobile class	5.23 (11)	5.14 (14)	4.34 (06)	2.70 (10)
Stationary manual class	4.00 (04)	3.42 (23)	1.07 (06)	2.89 (19)

variation, then here is a strategic point where additional investigation might further elaborate the process by which reference group theory operates.[8]

INTEGRATION INTO THE PRESENT GROUP AS A FUNCTION OF ADHERING TO FUTURE REFERENCE GROUPS WHICH DIFFER FROM THE PRESENT NEIGHBORHOOD GROUP

In order fully to differentiate ordered movement from unordered movement, it is necessary to consider future, as well as present and past, reference group orientations. Insofar as ordered movement is dominant among the respondents, adherence to a future group differing from the present group will not destroy integration into the present group. In contrast, if unordered movement characterizes the respondents, then adherence to future groups which are different will destroy integration into the present group.

In investigating empirically future orientations, it was necessary to use an item which would crystallize two specific attitudes of the respondent: (a) a positive orientation toward other neighborhoods, and (b) a perception of these other neighborhoods in terms of their career implications. The following item was used for this purpose: "Is there a good chance that your husband might take a job out of town?" The respondents who answered "yes" were categorized as having a future reference group which differs from their present neighborhood group. If they replied "no" or "don't know," they were described as having identical membership and reference groups. Table 4 indicates that in four out of four comparisons the individual who is likely to take a job out of town has more friends in his neighborhood than the person who is not likely

TABLE 4

Average Number of Neighbors Called on, by Chance of Taking a Job out of Town

	Average Number of Neighbors Called on in Current Neighborhood	
	Newcomers	Long-Term Residents
Will take job out of town	4.23 (105)	5.84 (171)
Will not take a job out of town	3.73 (142)	5.46 (404)
Don't know	3.42 (26)	5.17 (74)

[8] Though the major focus of this paper is on reference group orientation, an examination of Table 3 indicates that there is an independent occupational effect as well. In 17 out of 24 instances, the stationary manual class has fewer friends than any other occupational group. Because of the specific interests of this paper, the role of occupational resources and values will not be expanded in future analyses. However, the analyses will be carried on separately for each occupational group so that explanations regarding reference group orientation will not be contaminated by occupational resources or values.

to take a job out of town. This finding would be consistent with an ordered view of change and inconsistent with the position that change is unordered.

FUTURE REFERENCE GROUP ORIENTATION AND BUREAUCRATIC CAREER LINES

It should be clear that no claim is made that all individuals desirous of leaving the neighborhood will have more friends than those remaining. It is typical only of those occupations which are characterized by "careers." If the Gold and Slater data for similar age groups could be projected on to the present study, then individuals who are members of the upper class (either upwardly mobile or stationary upper) are, in 74 per cent of the cases, members of a bureaucratic organization with its implications for careers (8, pp. 66, 69). Furthermore, many individuals who are downwardly mobile are very likely, because of their youth (over 98 per cent of the sample was 45 or less), to be at the initial stages of a bureaucratic career rather than permanently settled in a non-bureaucratic, manual occupation. This means that the only occupational group which is clearly not affected by a career, in the sense of long-term ordered advances, is that of the stationary manual workers. It is, therefore, for this group that commitment to different future neighborhoods might lead to a lessening of integration into the present group. In Table 5 the extreme left hand cell in each row (newcomers and long-term residents considered separately) indicates those who make neighborhood friends despite their intentions to move out of the neighborhood. It can be seen that, for the manual group, the extreme left hand cell is larger than all others in the row in only one out of four instances, while for all other occupational groups this is true in ten out of eleven comparisons (ties ignored). Put somewhat differently, the differences between the extreme left hand cell and the other two cells in the row are smaller for the stationary manual group than for any other group in ten out of twelve instances. This is precisely the direction the trend should take, if occupations characterized by careers explain how integration into the present group is consistent with commitment to a different future group.

INTEGRATION INTO THE NEIGHBORHOOD GROUP AS A FUNCTION OF PAST, PRESENT, AND FUTURE REFERENCE GROUPS

Although the analysis of future reference groups tends to support the ordered mobility hypothesis, additional confirmation is provided when all three reference orientations are considered simultaneously. For it is still necessary to show that all three reference orientations operate independently in the manner anticipated. Table 6 presents the results. Table 6 reveals that, in 13 out of 15 instances, those who are willing to take a job out of town know more neighbors

TABLE 5

Average Number of Neighbors Called on in Current Neighborhood, by Chance of Taking Job Out of Town, by Occupational Mobility, by Length of Residence

	Average Number of Neighbors Known					
	Newcomers			Long-Term Residents		
	Will Take Job Out of Town	Will Not Take Job Out of Town	Don't Know	Will Take Job Out of Town	Will Not Take Job Out of Town	Don't Know
Stationary upper class	4.05 (39)	4.05 (38)	3.33 (09)	6.48 (53)	5.92 (82)	5.23 (27)
Upwardly mobile class	4.27 (38)	3.54 (47)	3.80 (10)	5.82 (69)	5.63 (97)	4.78 (28)
Downwardly mobile class	5.34 (18)	4.16 (18)	3.60 (05)	5.16 (23)	5.01 (66)	5.73 (07)
Stationary manual class	2.60 (10)	3.22 (40)	1.50 (02)	4.27 (20)	5.21 (160)	5.57 (12)

TABLE 6

Average Number of Neighbors Called on, by Orientation Towards Past, Present, and Future Neighborhood Groups, by Length of Residence

Past Neighborhood Reference Groups	Present Neighborhood Reference Groups	Average Number of Neighbors Known: Good Chance Will Leave Neighborhood for Out of Town Job	Good Chance Will Not Leave Neighborhood for Out of Town Job	Don't Know If Will Leave Neighborhood for Out of Town Job
		Long-Term Residents		
Negative	Positive	6.69 (48)	5.84 (122)	5.75 (25)
Positive	Positive	6.06 (65)	5.67 (189)	4.94 (31)
Negative	Negative	5.03 (28)	4.74 (049)	5.90 (35)
Positive	Negative	4.74 (30)	4.04 (042)	3.25 (08)
		Newcomers		
Negative	Positive	6.11 (18)	3.96 (028)	5.57 (07)
Positive	Positive	4.04 (35)	4.17 (54)	2.75 (12)
Negative	Negative	3.09 (21)	2.81 (27)	.... (00)
Positive	Negative	4.04 (31)	3.55 (33)	2.43 (07)

than those who are unwilling or undecided. (The left hand cell is larger than any other cell in the row.) At the same time it can be seen that, in 15 out of 17 cases, those who view their past groups negatively and their present groups positively call on more neighbors than any other combination of present-past reference orientation. (The top cell of each column is larger than any other cell in the column.) In other words, the person most likely to integrate into the neighborhood is (a) indifferent or negatively oriented toward his past neighborhood, (b) positively oriented toward his present neighborhood, and (c) positively oriented toward a future neighborhood which is different. In short, Table 6 provides evidence that all three time periods of reference group orientation play an independent role in determining current group integration. The results are consistent with the assertion that ordered change characterizes the respondents in this study.

FURTHER AREAS OF RESEARCH AND IMPLICATIONS FOR NEIGHBORHOOD COHESION IN URBAN SOCIETIES

Insofar as the above analysis provides evidence for the ordered change point of view, it suggests one basis by means of which some neighborhoods may retain their viability despite high membership turnover.[9] Furthermore, this

[9] One study (11, pp. 32–34) investigates four other mechanisms for group cohesion under conditions of high membership turnover, and suggests several others which are not empirically investigated.

basis—ordered occupational change—is supported by one of the major institutions of urban society, the industrial bureaucracy. This is the very institution which, according to many sociologists, lies at the root of neighborhood anomie. The concept of ordered change, with its implication of the stepping-stone reference group orientation, also provides a theoretical rationale for several studies which point out that neighborhood groups with high membership turnover also display very high cohesion.

Yet, the data are illustrative rather than conclusive, and several areas of research could be profitably pursued to elaborate the implications of ordered change and time dimensions in reference group theory. First, a more thorough study of the nature of cohesion under conditions of ordered movement is necessary. Secondly, the indices used for future, present, and past reference group orientation might be elaborated to see how much they are a function of a unique question wording and how much they measure the dimensions in question. Finally, it is necessary to spell out the theoretical and empirical evidence which justifies the assumption that people in corporations tend to associate neighborhood change with their career changes (11, pp. 6–37).

SUMMARY

From the standpoint of the history of theory, the present paper can be viewed as one of several which have sought to elaborate and refine reference group theory as first postulated by Hyman (10) and later developed by Merton and Kitt (12). More specifically, in future reference group analyses it will not be sufficient to differentiate between reference group and membership group. It will be necessary to determine whether the group is one stage of an ordered movement and to specify three reference group orientations—past, present, and future. Depending on which of these conditions held, one would predict high membership turnover to be consistent or inconsistent with group cohesion.

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REFERENCES

1. Beyer, G. H., T. W. Mackesey, and J. E. Montgomery, *Houses Are for People: A Study of Home Buyer Motivation*, Ithaca: Cornell University Press, 1955.
2. Blau, P. M., "Social Mobility and Interpersonal Relations," *American Sociological Review*, 1956, 21, 290–295.

3. Curle, A., "Transitional Communities and Social Re-Connection," Part I, *Human Relations*, 1947, 1, 45–68.
4. Curle, A., and E. L. Trist, "Transitional Communities and Social Re-Connection," Part II, *Human Relations*, 1947, 1, 240–288.
5. Festinger, L., "Architecture and Group Membership," *Journal of Social Issues*, 1951, 7, 152–163.
6. Firey, W., *Land Use in Central Boston*, Cambridge: Harvard University Press, 1947.
7. Foote, N. N., "Professionalization of Labor in Detroit," *The American Journal of Sociology*, 1953, 58, 371–380.
8. Gold, M., and C. Slater, "Office, Factory, Store, and Family: A Study of Integration Setting," *American Sociological Review*, 1958, 23, 64–74.
9. Hoselitz, B., "The City, the Factory, and Economic Growth," in P. K. Hatt and A. J. Reiss, Jr. (eds.), *Cities and Society: Revised Reader in Urban Sociology*, Glencoe: The Free Press, 1957.
10. Hyman, H., "The Psychology of Status," *Archives of Psychology*, No. 269, 1942.
11. Litwak, E., "Primary Group Instruments for Social Control in Industrial Society," Ph.D. dissertation, Columbia University, 1958.
12. Merton, R. K., and A. S. Kitt, "Contributions to the Theory of Reference Group Behavior," in R. K. Merton and P. F. Lazarsfeld (eds.), *Continuities in Social Research: Studies in the Scope and Method of "The American Soldier,"* Glencoe: The Free Press, 1950.
13. Newcomb, T., "Attitude Development as a Function of Reference Groups: The Bennington Study," in M. Sherif, *An Outline of Social Psychology*, New York: Harper and Brothers, 1948.
14. Rossi, P. H., *Why Families Move*, Glencoe: The Free Press, 1955.
15. Whyte, W. H., Jr., *The Organization Man*, New York: Simon and Schuster, 1956.

Interrelations Among Two Dimensions of Sociometric Status, Group Congeniality and Accuracy of Social Perception [1]

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Accuracy in perceiving, judging, or estimating the behavior of another has been frequently studied in terms of its relationship to effectiveness in social interaction. When effectiveness was defined as the sociometric status of the perceiver, some investigators (6, 7, 9) found it to be positively related to accuracy, while others (8, 10, 15) found no such relationship. In the attempt to resolve this contradiction, social psychologists have turned their attention to the analyses of artifacts involved in various measures of accuracy (4), of the processes by which we come to know another (17), or of the conditions in which veridical social perception is important (16). This study falls into the latter category, for it reports data collected to test the rather simple proposition that the group environment, through its influence in determining the goals, and hence the goal-relevant activities, of group members, will affect the relationship between measures of accuracy of social perception and sociometric status.

In this study, the accuracy with which members of a social group perceive one another's behavior is conceptualized in terms of a means-end relationship. It is possible for people in groups to work toward at least two kinds of goals as they interact with one another; one set of goals being group-oriented, the other, self- or ego-oriented. In the first case accurate information about others' beliefs is likely to facilitate group action, while, at other times or to other people, the same information could serve as the means used to achieve the end of ego-gratification.

Whether or not information about specified opinions of others is judged as relevant to group members' means-to-ends depends, in part, upon the goals made salient by the psychological environment of the group. An earlier report presented data to support the hypothesis that the task-oriented opinions of others would be more goal-relevant and hence more accurately perceived in congenial than in noncongenial groups (5). In this paper the formulation is extended to a consideration of the conditions under which sociometric status is related to accurate social perception.

[1] This paper presents a portion of the research in a dissertation submitted in partial fulfillment of the requirements for the Ph.D. degree at the University of Illinois, 1954. Special thanks are due Dr. N. L. Gage for his help and encouragement, and to Miss Beatrice Clark for her help in the analysis of data.

When the environment enables group members to accept the group task as a personal goal, the activities of those most accurate in task-oriented social perception can, to some extent, benefit all group members. These activities are more likely to be valued when persons are evaluated in terms of the group task, than when they are evaluated in terms of some other dimension, e.g., personal preference. If, on the other hand, the group environment discourages acceptance of group goals, action taken in the attempt to reach such goals would not be seen as beneficial by other group members. In this case whether or not such actions were based on accurate perception of task-oriented phenomena would be of small consequence to group members when they evaluate others' contributions to the group task.

It was earlier suggested that congenial environments are more likely to lead to the acceptance of the group task as a personal goal, while non-congenial environments lead group members to hold more self-centered goals. Assuming that a sociometric measure of contribution to the group task is task-relevant, and that persons are motivated to act upon their perceptions, the following hypothesis concerning accuracy of social perception and sociometric status is presented: Task-relevant sociometric status is more highly related to accuracy of task-oriented perception in congenial than in non-congenial groups.

Hypothesis 1 suggests the conditions under which the relationship between perceptual accuracy and sociometric status should be direct and positive. The validity of the rationale underlying hypothesis 1 would be further confirmed, should systematic variation of the original conditions lead to predictable changes in the relationship between perceptual accuracy and sociometric status. Thus, if sociometric status were to be measured in terms of a dimension more relevant to self-oriented than to task-oriented goals, e.g., in terms of popularity instead of contributions made to the solution of a group task, those behaviors based on task-oriented perceptual accuracy should be less relevant to the basis for choice, irrespective of the congeniality of the group. In terms of the rationale underlying the first hypothesis, such a variation requires a second hypothesis: Task-oriented perceptual accuracy is not related to popularity status in either congenial or non-congenial groups.

Shifting the focus of perception to phenomena which are less relevant to task achievement should also reduce the relationship between task-oriented status and perceptual accuracy. Thus when perceptual accuracy is measured in terms of the interpersonal preferences in a group, there is no reason to expect congenial and non-congenial group members to differ in the importance they place upon their co-workers' accuracy when ranking the co-workers' contribution to the group task. A third hypothesis, then, is consistent with the rationale of this study: Accuracy in perception of others' interpersonal prefer-

ences is not related to task-relevant sociometric status in either congenial or non-congenial groups.[2]

METHOD

Subjects

One hundred and twenty-eight public school teachers, half of whom were males, were recruited from different classes in a summer session of the University of Illinois. To minimize previous acquaintance, groups were composed by drawing each subject from a different section of a basic course in educational psychology.

Design

Although sex was not considered to be an important variable in the formulation of the problem, the study was designed so that the effects of this variable could be studied. The groups, composed of five persons of the same sex, were randomly given instructions designed to create a congenial or non-congenial group atmosphere. Following these instructions, each group worked on a standard discussion task, after which the members marked a set of rating scales designed to measure the accuracy of their perception of task-oriented and ego-oriented behaviors of others, and their willingness to continue working with the group. In addition, they ranked other group members as to their contribution to the group task, and as to how well they liked them.

Definition of Terms

Congenial groups. At the time of recruitment, all subjects were given a standard personality test as well as a questionnaire designed to measure attitudes towards working in groups. They were told that this information would be used to assign them to discussion groups in which they would find the other members congenial. Upon arriving at the laboratory, subjects assigned to the congenial treatment were told that they stood very high on a scale of congeniality developed from the preliminary tests: "The matching was so good as to be expected only once or twice in all the groups studied," and that they should get on well together.

Non-congenial groups. The subjects assigned to these groups were told that

[2] A fourth hypothesis consistent with the rationale underlying this study (i.e., those best liked by co-workers will be more accurate in perceiving group members' interpersonal preferences than will those least liked, in non-congenial groups more so than in congenial groups) was not tested. The hypothesis requires the assumption that affective, self-oriented goals rather than task-oriented goals would be more relevant in non-congenial groups; as data bearing on this assumption indicated that the congeniality of the group did not significantly affect accuracy in perceiving others' interpersonal preferences (5), this hypothesis could not be tested by the data.

the limited number of available subjects made it impossible to match groups equally as to congeniality. They were told that they stood very low on the congeniality scale, that it was necessary to put people with opposing views in their group, that they were about as bad a matching as was possible, and that they probably would not find their group very congenial.

Task. The task was introduced as one that would enable psychologists to relate the subjects' scores on the previous tests to their ability to take the role of another person. It was implied that psychologists think this ability important in establishing good human relationships with other people.

The subjects were asked to role-play a group of trainees in vocational guidance who were meeting to discuss the disposition of a vocational counselee. They were asked to reach agreement upon a recommendation concerning the disposition of the case. Each subject was given identical test and biographical information about the hypothetical client, but in addition was asked to present a recommendation based on one of five different orientations toward the data. Thus, one subject suggested a job on the basis of an orientation that emphasized the need to consider present and future job opportunities. Another subject's suggestion was based on the relationship between personality factors and job requirements, a third on the role of training and past experience, a fourth on test scores, and the fifth on test scores in combination with training and past experience. It was expected that the different approaches would not only provide evidence of differential orientation toward the path to task completion, but, initially at least, would lead to disagreements which would produce behavior indicative of interpersonal preferences on the part of group members.

Subjects were allowed a standard amount of time to become familiar with both the data and the point of view they were to support in the discussion. To insure that each group would have an opportunity to hear all points of view, the instructions required each person to present his suggestion and opinion in turn. After each subject had spoken twice, a general discussion was permitted.

Accuracy of perception of task-oriented behavior. Task-oriented behavior is defined, conceptually, as the manipulation, symbolic or otherwise, of the idiosyncratic content of the task. Its operational definition, like that of ego-oriented behavior, becomes complex when the individual is a member of a problem-solving group. In this case, the definition must incorporate one's reaction to others' acts. On the basis of these considerations, task-oriented behavior is defined as verbal or non-verbal behavior that communicates either the frame of reference used by a person to organize the task data, or his reaction to the frames of reference used by others to organize the same data.

Task-oriented perceptual accuracy is defined as the discrepancy between each S's rank-ordering of the use of four orientations toward counseling as he

thinks the other Ss would rank-order them, and the other S's actual rank-ordering of the same four orientations.

An error score for each S was obtained as follows: Each S was given a booklet containing the definitions of the orientations toward counseling and five sets of rating scales. Each scale consisted of 20 intervals distributed over six designation points from "never used" to "exclusive use." Each filled out one set of ratings to indicate the extent to which he felt he had used the four independent orientations in his own discussion. Each S also filled out the remaining sets of scales to indicate his perception of the rank order, of the extent to which each of the others favored the various orientations. Thus, each S's own responses provided a key against which the estimates made by the others could be scored for errors. An over-all error score representing S's ability to predict accurately the rank order assigned to each orientation by each S was obtained by averaging S's squared errors over all orientations and others.

Accuracy scores defined in terms of a rank-order metric have the advantage of eliminating the possibility that low-error scores merely reflect the judges' unwillingness to use extremes in judging the deviations of others from a central tendency. Scores derived by the rank-order method reflect a component of accuracy that Cronbach (4) terms SAR, i.e., accuracy in judging the rank-ordering of the items made by the group as a "generalized other." Since items correspond to task orientations, this type of accuracy is assumed to be relevant to the problem studied.

Accuracy of perception of non-task-relevant behavior. Ego-oriented behavior is assumed to be non-task-relevant behavior. The individual is said to be ego-oriented when his goal is the enhancement of self without regard to the demands of the task environment (13). Ego-oriented behavior refers to the manipulation of elements in the task situation that bear on the self as a value. It is assumed that, in the process of working through disagreements, Ss communicate information pertinent to their orientation to, and evaluation of, their fellow group members as persons. Ego-oriented behavior, then, is defined as verbal or non-verbal behavior that communicates a person's relative liking of other group members. Ego-oriented accuracy was measured in a manner similar to that of task-oriented accuracy. In this case, the S rated the extent to which he liked the others and estimated the ratings each of the others gave their co-workers. Ratings were made on scales which, but for reworded designation points, were identical with those used for task-orientation. An error score was derived, as described in the section on task-oriented perception. In this case, however, the other members of the group were the "items" which Ss rank-ordered.

Task-relevant sociometric status. Status on this dimension is defined as di-

rectly proportional to the rank order in the group of the sum of weighted ranks assigned to a person by his co-workers in response to the request: "Rank other members of your group in the order in which you feel they helped the group to arrive at its goal of formulating a recommendation for the vocational guidance of ....." This status will hereafter be referred to as "productivity" or "productivity status."

Non-task-relevant sociometric status. Status on this dimension is defined as being directly proportional to the rank order of the sum of weighted ranks assigned one by others in response to the request to rank-order group members in terms of one's liking for them. This status will hereafter be referred to as "popularity" or "popularity status."

Treatment of Data

In mobilizing data to test hypothesis 1, the mean task-relevant accuracy scores of those rated most and least productive in each group were compared. For hypothesis 2 the same comparison was made between those most and least liked in the group, and finally for hypothesis 3 those rated most and least productive were compared as to their accuracy in perception of interpersonal relations. This procedure was based on the assumption that the most reliable and valid status ratings will be obtained by those group members who fall at the extreme opposite ends of a given status continuum, and that their behaviors will be most likely to be differently evaluated by others.

The accuracy scores were analyzed in terms of the mean difference scores obtained between high and low status persons in groups differing as to sex and congeniality. The single score per group which resulted from this procedure permitted the use of variance attributed to groups within conditions as the error term to test the effects of congeniality and sex upon the difference between the accuracy of the most and least valued group members.

The discrepancy score described above is derived by subtracting the perceptual error of high-status persons from the perceptual error of low-status persons. Thus, the higher the score, the greater will be the relative inaccuracy of the low-status person. Evidence in support of hypothesis 1, for example, would best be provided by data which show a high discrepancy score to characterize congenial groups, while a low or even negative discrepancy score should characterize non-congenial groups.

Although hypothesis 2 results from consistent application of the rationale of this study, it cannot be tested directly, for it requires a failure to reject the null hypothesis concerning differences in accuracy between the most and least well-liked members of a group. Should the null hypothesis not be rejected, the most that can be said is that the data provide no evidence in support of an alternate hypothesis inconsistent with the rationale of this study, i.e., the

hypothesis that superior task-oriented perceptual accuracy is more likely to characterize the most, as opposed to the least, popular persons, particularly in the congenial groups. With appropriate modifications, the same caution holds true for hypothesis 3.

RESULTS

Some of the data suggest that the instructions successfully created relatively more congenial and less congenial groups. Using a 20-point scale, members of "congenial" groups, compared to members of "non-congenial" groups, rated their co-workers as more likeable (16.0 to 14.6), expressed greater satisfaction with their group's progress (15.0 to 11.6), and indicated a greater willingness to work with the same group on a similar project in the future (16.7 to 15.2). Mean differences were significant beyond the .02 level when the two-tailed t test was applied to each comparison. While these measures are probably not independent of one another, they are consistent in suggesting that members of congenial groups found their group experience more attractive than did members of non-congenial groups. The above data gain in significance, moreover, in the light of questionnaire data collected prior to the experiment. Subjects destined to be in congenial groups showed no greater preference to work in groups than did those destined to be in non-congenial groups; in fact the analysis indicated that non-congenials indicated a slight, though not significant, preference for group work.

While there are data to support the conclusion that groups differed in congeniality, as planned, the assumption that the group task is more likely to be accepted as a personal goal in congenial groups cannot be tested directly. Indirect support for this assumption may be inferred, however, from data which indicate that members of congenial groups are less tenacious in maintaining their original views intact, and are more aware of others' task-relevant opinions.[3] The group task is so designed that personal acceptance of it would

[3] Coders unfamiliar with the purposes of this study analyzed records of the group discussion. All responses subsequent to each subject's first statement of his position were coded according to a ten-point scale of rigidity—modifiability of outlook (1, most rigid = S ignores others' recommendations and reiterates own argument; 5, intermediate = S incorporates portions of others' arguments into his own recommendation; 10, most modifiable = S gives up own position in favor of another's, or in the attempt to seek a new basis for agreement). Mean group scale values arrived at by two independent coders correlated .75 ($.01 < P$) when a sample of ten groups was alternately drawn from congenial and non-congenial groups. Mean of group means for all congenial groups = 5.42; for all non-congenial groups = 4.46; $t = 2.40$, $.05 > p$ (2 tailed). These congenial groups have also been shown to be significantly more accurate than non-congenial groups in the accuracy with which group members perceived the weight other members assigned to various approaches to the problem (5). The latter finding is important in that it suggests that the greater modifiability of congenials does not reflect lack of involvement in the task.

TABLE 1

Mean Coefficients of Concordance of Productivity and Popularity Ranking in Groups Categorized by Sex and Congeniality

Sociometric Dimensions	Congenial Groups		Noncongenial Groups	
	$\bar{x}$ W Men	$\bar{x}$ W Women	$\bar{x}$ W Men	$\bar{x}$ W Women
Productivity	.594	.618	.476	.564
Popularity	.252	.374	.283	.530

All means based on N of 7.

seem to require some willingness to deviate from one's originally stated position, in order to find a basis for the agreement necessary to complete the task. Conversely, a rigid maintenance of one's original position would seem to characterize personal goals which are ego-centered rather than group-task-centered. The differences between congenial and non-congenial groups suggest that members of congenial groups are group-task-oriented rather than ego-centric in their approach to the problem.

As status variables are central to the formulation of the hypotheses, it is also important to determine whether or not the two congeniality conditions differ in the extent to which a clear-cut status structure emerges. Some indication of the relative consensus with reference to status rankings in congenial and non-congenial groups may be inferred from Table 1, in which are listed the mean coefficients of concordance of each sociometric dimension. These coefficients were obtained by applying Taylor's (19) modification of Kendall's W coefficient (12) to the rankings of each group.

TABLE 2

U's and Critical Ratios Obtained for Differences Between Coefficients of Concordance of Productivity and Popularity Choices Categorized by Sex and Congeniality

Categories Compared *	Productivity W		Popularity W	
	U–U_e	C.R.†	U–U_e	C.R.
Congenial-noncongenial	25.5	1.17	—5.5	—.25
Men-women	—17.5	—.80	—44.5	—2.04‡
Men congenial + women noncongenial—women congenial + men noncongenial	9.0	.41	14.0	.64

* W's are compared in order of categorization indicated in table. Thus a positive U-U_e in the congenial-noncongenial comparison means that congenial groups had higher W's and vice versa.

† As N = 14 in each category $\sigma U = 21.76$ for all tests.

‡ $P < .05$.

As the distribution of W's for popularity rankings were skewed, the Mann-Whitney U test (14) was used to test effects of congeniality, sex, and combinations thereof for both sets of W's. Data listed in Table 2 show that only the sex breakdown gives a significant difference in the distribution of W's. Thus the data provide no support for the hypothesis that the congeniality of the group affects the extent to which members agree in ranking others' productivity or likeability. These data suggest that, should relationships between accuracy and status differ according to the congeniality of the group, such differences would not be due to the effect of group congeniality on concerns about status. It is interesting to note, however, that these data support Taylor's (19) finding that consensus is more difficult to achieve when ranking others on emotional, as compared to task-oriented, criteria—75 per cent of the popularity W's are lower than the corresponding productivity W's (n 28. C.R. $= 2.64$, p. $< .01$), a proportion which would occur by chance less than one time in a hundred.

Another status-relevant consideration implicit in the rationale of this study is the assumption that subjects will tend to like and/or dislike different persons than those whom they rate as most and/or least productive. Although this assumption would seem to be consistent with data previously reported by Bales and Slater (1), it is desirable to examine the extent to which such shifts actually occurred. Table 3 suggests that while shifts occurred in both high and low rankings, the changes were more pronounced in the case of those ranked high. Some 68 per cent of those ranked most productive were not ranked most popular, but only 43 per cent of those ranked least productive were not ranked least popular. The Chi-squared test applied to changes in the two status positions in both kinds of congenial groups resulted in a χ^2 of 3.54, which with one degree of freedom does not quite reach significance at the .05 level. These results, while not conclusive, raise the possibility that role differentiation is more likely to occur with respect to high status positions, whereas low status, once assigned, tends to persist over several dimensions.

There remains the question of the extent to which accuracy in perceiving

TABLE 3

Indication of Change in Popularity Ranking of Group Members Rated Most and Least Productive

	Number Same in Popularity Rank			Number Different in Popularity Rank		
	Congenial	Noncongenial	Total	Congenial	Noncongenial	Total
Most productive *	3	6	9	11	8	19
Least productive	8	8	16	6	6	12

* Due to the smallness of sample, results are not categorized by sex.

TABLE 4

Mean Task-Oriented Perceptual Error Scores of Those Chosen as Most and Least Productive and Popular Members of Groups Categorized by Congeniality and Sex

Sociometric Status	Congenial Groups		Noncongenial Groups	
	$\bar{x}$ Men	$\bar{x}$ Women	$\bar{x}$ Men	$\bar{x}$ Women
Productivity				
Most productive	6.40	5.97	8.03	7.21
Least productive	9.56	7.87	7.44	6.87
Popularity				
Most popular	6.14	7.43	7.31	7.23
Least popular	8.71	6.37	8.71	7.51

All means based on N of 7.

others' task-oriented opinions is independent of accuracy in perceiving their interpersonal preferences. There is little evidence that the two kinds of accuracy are related, as the two error scores correlated only —.099, .148, —.148, and —.017, for congenial men and women and non-congenial men and women respectively. With n's of 20, 29, 25, and 19,[4] none of these coefficients were significant at the .05 level.

Data relevant to testing the hypotheses are located in Tables 4, 5, 6, and 7. Mean error scores in the perception of task-oriented phenomena are listed in Table 4. Hypothesis 1 predicts that the discrepancy will be greater in congenial groups. The data indicate that, regardless of sex, congenial and non-congenial groups differ from one another in the degree to which individuals rated as most productive differ from those rated as least productive. In congenial groups, the most productive members were more accurate in task-oriented preception than were the least productive members. In non-congenial groups, the differences are slighter and in the opposite direction, i.e., a higher mean error score was recorded for the highly ranked persons.[5] Mean discrepancy scores of 3.15 and 1.90 were recorded in congenial men's and women's groups respectively; while discrepancy scores of —.59 and —.35 were recorded in the respective groups of non-congenial men and women. Results of the analysis of variance in Table 5 show that only the difference in means attri-

[4] Data from groups in which one person was missing were eliminated from the analysis due to a differential effect upon ease of perceiving the two kinds of phenomena.

[5] The mean error scores of the intermediate ranks were also consistent with the hypothesized relationship. Means of 6.53 for men and 6.36 for women fall in between the extreme ranks in congenial groups, while means of 8.34 for men and 8.86 for women stand in no linear relation to the extreme ranks in the non-congenial groups.

TABLE 5

Analysis of Variance of Discrepancy of Task-Oriented Perceptual Error Scores Between Most and Least Productive and Popular Members in Groups Categorized by Congeniality and Sex*

Source of Variance	Productivity Discrepancy Scores		
	df	Mean Square	F
Congeniality	1	62.70	7.55‡
Sex	1	1.80	n.s.
Interaction: congeniality x sex	1	3.93	n.s.
Residual†	24	8.30	

Source of Variance	Popularity Discrepancy Scores		
	df	Mean Square	F
Congeniality	1	.08	n.s.
Sex	1	46.03	5.32‡
Interaction: congeniality x sex	1	7.93	n.s.
Residual†	24	8.65	

6 Homogeneity of variance tested by Bartlett's method (2).
† Residual used as error term.
‡ $P < .05$.

buted to the congeniality of the group is significant beyond the .05 level; thus the data are interpreted as providing support for hypothesis 1.

Data bearing on hypothesis 2, which concerns the task-oriented accuracy of most and least popular group members, are listed in Tables 4 and 5. Mean error scores in Table 4 indicate that the sex, rather than the congeniality, of the group affects the relative accuracy of the most and least popular group members. Regardless of the congeniality of the group, the most popular men err less than the least popular men to a relatively greater degree than is the case for most and least popular women. Transformation of these data into a discrepancy score for each group resulted in mean discrepancies of 2.57 and 1.40 in men's groups, compared to discrepancies of −1.06 and −.10 in women's groups. The analysis of variance in Table 5 shows that only the difference in the mean discrepancy attributable to the sex of the group is significant beyond the .05 level.[6]

It has been previously noted that groups have more difficulty in reaching consensus on popularity rankings than on productivity rankings. Such a finding may reflect the fact that criteria used to assess the likeability of another are

[6] Mean error scores of 6.96 and 7.81 recorded for men of intermediate popularity rank in congenial and non-congenial groups, respectively, fall in between those of the most and least popular men, while means of 6.20 for congenial women and 8.02 for non-congenial women stand in no linear relation to the means of the extreme ranks.

TABLE 6

*Mean Interpersonal-Relations-Oriented Perceptual Error Scores of Those Chosen as Most and Least * Productive Members of Groups Categorized by Congeniality and Sex*

Sociometric Status	Congenial Groups				Noncongenial Groups			
	$\bar{x}$ Men	n †	$\bar{x}$ Women	n	$\bar{x}$ Men	n	$\bar{x}$ Women	n
Productivity								
Most productive	9.52	4	8.52	6	10.24	5	10.68	4
Least productive	8.88	4	8.17	6	9.48	5	10.32	4

* $\bar{x}$ Intermediate ranks—Congenial men, 8.26: Congenial women, 7.45; Noncongenial men, 8.21; Noncongenial women 6.36.

† Missing persons in experimental groups so affected the perceptual difficulty of this measure that these groups were excluded from the analysis.

apt to be more private, thus more heterogeneous than those used to assess productivity. The more personal character of likeability criteria suggests that they are less likely to be affected by a condition (congeniality) which is designed to increase the relevance of task-oriented behavior to task goals. To a certain extent then, the above data support the rationale of the study. However, the data also suggest that the sex variable may be more important than first implied by these formulations, particularly with reference to criteria used to assess others' likeability.

Mean error scores in the perception of others' interpersonal preferences are listed by productivity status in Table 6. From the analysis of variance of the discrepancy scores in Table 7, we see that we cannot reject the hypothesis that mean discrepancy scores of —.65, —.35, —.76, and —.42 for congenial and non-congenial men and women respectively are drawn from a common popu-

TABLE 7

*Analyses of Variance * of Discrepancy of Interpersonal Realtions Perceptual Error Scores Between Most and Least Productive Members in Groups Categorized by Congeniality and Sex*

Source of Variance	df †	Mean Square	F
Congeniality	1	.04	n.s.
Sex	1	.47	n.s.
Interaction: Congeniality x Sex	1	1.06	n.s.
Residual ‡	15	355.29	

* Homogeneity of variance tested by Bartlett's method (2).

† Tsao's (20) approximation method was applied to correct for disproportionate subclass n.

‡ Error term.

TABLE 8

Motivation Scores of Most and Least Productive Members of Congenial and Noncongenial Groups

Sociometric Status	Congenial Groups		Noncongenial Groups	
	$\bar{x}$ Men	$\bar{x}$ Women	$\bar{x}$ Men	$\bar{x}$ Women
Productivity				
Most productive	15.94	17.71	16.14	15.64
Least productive	16.43	15.43	15.29	12.29

All means based on N of 7.

lation of such scores. Thus the data do not contradict hypothesis 3 and are consistent with the rationale of this study.

POST HOC ANALYSIS

There is evidence to indicate that the relationship between productivity and task accuracy is not merely a by-product of the effect of congeniality upon differences in motivation of the high and low status persons. Such concomitancy would occur if members of congenial groups rated a person's productivity in direct relation to his apparent motivation; if accuracy were directly proportional to motivation; and if the congenial instructions resulted in a positive skewing of motivation scores, thus increasing the variability of motivation and the likelihood that the discrepancy between the motivation of high and low status persons would vary significantly with congeniality.

Motivation [7] scores in Table 8, while generally higher for those rated as most contributing to the groups, were not consistently so; nor did the analysis of variance of the mean-per-group discrepancy in motivation between high and low status persons indicate significant variance attributable to congeniality, sex, or interaction. When correlations between motivation and task-oriented accuracy were computed separately for each sex within each congeniality treatment, none of the correlations ($r = -.06, -.26, .15, .01$ for congenial and non-congenial men and women, respectively) were significant at the .05 level. Finally, Bartlett's (2) test of homogeneity of variance indicated that groups were drawn from a population of groups with common variance as to motivation scores, ($\chi^2 = 5.84, n = 28$).

DISCUSSION

The results of this study provide one possible explanation of inconsistent experimental results reported in previous studies of accurate social perception

[7] Subjects' ratings of their willingness to work with the same group on a similar problem was taken as evidence of motivation to work on the problem given in the experiment.

and interpersonal effectiveness. The data suggest that the context in which accuracy and status are measured strongly affects the relationship between these measures by determining which dimensions of accuracy and status measurement are relevant to group members. Although in this study a mutual relevance of measures of perceptual accuracy, sociometric status, and group members' goals was assumed to occur only in a group condition (congeniality) which encouraged acceptance of task-oriented goals, it is theoretically possible to establish conditions where other kinds of goals would be relevant. Thus it is conceivable that those studies which reported positive relationships between accuracy of social perception and sociometric status (6, 7, 9) differed from those which did not (8, 10, 15) in the extent to which accuracy and status were measured on dimensions relevant to the goals of group members.

It has already been noted that the above interpretation depends largely upon the validity of the assumption that one is likely to identify personally with the goal of carrying out a group task when one is with congenial, but not with non-congenial, co-workers. Although there is evidence indirectly to support this assumption, the inability to test the assumption directly requires that the interpretation presented herein be considered as tentative and subject to revision, should congeniality be shown to be unrelated to any tendency to accept a group goal as a personal goal.

Tentatively, then, the data are interpreted as confirming Chowdhry and Newcomb's findings in regard to accuracy of social perception and the personal relevance of the perceived phenomenon and sociometric status (3). In addition, the data confirm their findings in a manner which appears to avoid an artifact earlier attributed to the method they used to measure accuracy (4).

The results of this study also seem to be consistent with Steiner's analysis of conditions which should obtain before one expects a relationship between accuracy in social perception and "interpersonal competence" (sociometric status) (16). In his work, published after these data had been collected, Steiner suggests the interpersonal competence would be positively related to accuracy in social perception only when group members are motivated, perceived qualities are relevant to group activities, members are free to alter their own behaviors in response to their perceptions, and behavioral changes in consequence of accurate social perception produce a more thoroughly integrated dyadic system. The conditions of this study strongly suggest that Steiner's conditions in regard to interpersonal competence were met in congenial groups to a greater degree than in non-congenial groups. One speculates as to whether the conditions necessary to a relationship between accuracy in social perception and interpersonal competence could ever obtain in a group that remained truly non-congenial, for is it possible for a more thorough inte-

gration of dyadic systems to occur in the presence of continuing non-congeniality?

On the other hand, it is of some interest to consider the data in the light of other explanations of the meaning of relationships between accuracy in social perceptions and effectiveness in groups. Thus, while not contradicting Talland's (18) and Horwitz's (11) suggestions that leaders are accurate because of, respectively, their opinion-creating activities, and their superior information-gathering positions, the data do suggest that accuracy is related to high sociometric status in the absence of such possibilities.

Finally, the difference between sexes in the degree to which accuracy of task-oriented perception is related to popularity status suggests that the relationships among task-oriented phenomena, and productivity and popularity status are likely to be more complex than was implied in the original formulation of this study. Viewed in the light of women's significantly greater agreement as to whom they like, sex differences in the relationship between task-related accuracy and popularity status suggest the desirability of further research into the interaction of situation and sex-related factors in determining the personal attractiveness of others.

SUMMARY

This study tests the proposition that accuracy in social perception and sociometric status in a group are more likely to be directly related under conditions wherein measures of both accuracy and status are relevant to goals accepted by group members. To test this proposition, fourteen groups of men and fourteen groups of women, randomly assigned to conditions of high and low group congeniality, discussed a task in which a different position was defended by each group member. Accuracy was then measured with reference to knowledge of others' positions (task-relevant) and interpersonal preferences (less task-relevant), while sociometric status was measured with reference to peers' ratings of group members' productivity (task-relevant) and popularity (less task-relevant).

The findings were as follows:

1. In congenial groups to a greater degree than in non-congenial groups, the most productive member (regardless of sex) made significantly fewer errors in estimating others' task-oriented behavior than did the member rated least productive.
2. In male but not in female groups, the most popular member (regardless of congeniality) made significantly fewer errors in estimating others' task-oriented behavior than did the member rated least popular.
3. No evidence was developed to support the contention that congeniality, sex, or interactions thereof were related to differences in the most and least productive group members' ability to predict others' interpersonal preferences.

4. Groups of women showed greater agreement in their ranking of members' popularity than did groups of men.

These results were interpreted as providing qualified support for the proposition that a positive relationship between accuracy of social perception and sociometric status is more likely to occur when group conditions enhance the relevance of measures of accuracy and status to group goals held in common with others. It was suggested that this interpretation might help to rationalize incompatible findings which characterize earlier studies of accurate social perception. The study of phenomena related to sex role expectations was suggested as a means of exploring further the sex differences discovered in the relationship between task-accuracy and popularity ratings, and in the congruence of popularity rankings.

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REFERENCES

1. Bales, R. F., and P. E. Slater, "Role Differentiation in Small Decision-Making Groups," in T. Parsons and R. F. Bales (eds.), *Family, Socialization and Interaction Process,* Glencoe, Illinois: Free Press, 1955.
2. Bartlett, M. S., "Some Examples of Statistical Methods of Research in Agriculture and Applied Biology," *Journal of the Royal Statistical Society, Suppl.,* 1937, 4, 131–170.
3. Chowdhry, Kamla, and T. M. Newcomb, "The Relative Abilities of Leaders and Non-Leaders to Estimate Opinions of Their Own Groups," *Journal of Abnormal and Social Psychology,* 1952, 47, 51–57.
4. Cronbach, L. J., "Processes Affecting Scores on 'Understanding of Others' and 'Assumed Similarity,'" *Psychological Bulletin,* 1955, 52, 177–193.
5. Exline, R. V., "Group Climate as a Factor in the Relevance and Accuracy of Social Perception," *Journal of Abnormal and Social Psychology,* 1957, 55, 382–388.
6. Gage, N. L., "Explorations in the Understanding of Others," *Studies in Higher Education,* Purdue University, 1951, No. 79, 86–96.
7. Gage, N. L., and G. Suci, "Social Perception and Teacher-Pupil Relationships," *Journal of Educational Psychology,* 1951, 42, 144–152.
8. Gage, N. L., and R. V. Exline, "Social Perception and Effectiveness in Discussion Groups," *Human Relations,* 1953, 6, 381–396.
9. Greer, F. L., E. H. Galanter, and P. G. Nordlie, "Interpersonal Knowledge and Individual and Group Effectiveness," *Journal of Abnormal and Social Psychology,* 1954, 49, 411–414.
10. Hites, R. W., and D. T. Campbell, "A Test of the Ability of Fraternity Leaders to Estimate Group Opinion," *Journal of Social Psychology,* 1950, 32, 95–100.
11. Horwitz, M., "The Conceptual Status of Group Dynamics," *Review of Educational Research,* 1953, 23, 309–328.
12. Kendall, M. G., *Rank Correlation Methods,* London: Griffin, 1948.

13. Lewis, Helen B., "An Experimental Study of the Role of the Ego in Work," *Journal of Experimental Psychology*, 1944, 34, 113–126.
14. Mann, H. B. and D. R. Whitney, "On a Test of Whether One or Two Random Variables is Stochastically Larger Than the Other," *Annals of Mathematical Statistics*, 1947, 18, 50–60.
15. Ohio State University, Personal Research Board, "Studies in Naval Leadership," Columbus: Ohio State University, Research Foundation, 1949.
16. Steiner, I. D., "Interpersonal Behavior as Influenced by Accuracy of Social Perception," *Psychological Review*, 1955, 62, 268–274.
17. Tagiuri, R. and L. Petrullo (eds.), *Person Perception and Interpersonal Behavior*, Stanford University Press, 1958.
18. Talland, G. A., "The Assessment of Group Opinion by Leaders and Their Influence on Its Formation," *Journal of Abnormal and Social Psychology*, 1954, 49, 431–434.
19. Taylor, F. K., "The Therapeutic Factors in Group-Analytic Treatment," *Journal of Mental Science*, 1950, 96, 967–997.
20. Tsao, F., "General Solution of the Analysis of Variance and Covariance in the Case of Unequal or Disproportionate Numbers of Observations in the Sub-Classes," *Psychometrika*, 1946, 11, 107–128.